The Environmental Challenge

…a competition for University students

The Environmental Challenge is proudly hosted by the Pacific Northwest International Section of the Air & Waste Management Association (www.pnwis.org).

THE PURPOSE

The Environmental Challenge (EC) Program is a student team competition to prepare and present an optimal solution to a complex "true-to-life" environmental problem. The program presented is of current value, representative of the conference, and requires multi-disciplinary approaches for success. The EC is designed to promote formation of student teams with the broadest feasible range of environmental disciplines including, but not limited to, engineering, planning, policy, and economics. Teams must research the problem background as well as the technical, social, economic, and political aspects of the situation. Teams must stay apprised of ongoing events related to the problem by adjusting their solutions appropriately leading up to and during the conference.

The Challenge seeks not only technical and scientific analyses, but solutions that are presented in conjunction with the development of appropriate regulatory approaches and resolution of political and community issues. We do not give you a lot of numbers to crunch. We are more interested to hear how you dissect the issues involved, interpret the problem, arrive at your conclusions, and communicate your thoughts. We want you to have fun!

The Environmental Challenge gives student teams an opportunity to develop solutions to a mock environmental problem and have the experience of presenting their solution to a panel of environmental professionals. This exercise gives everyone attending the conference a chance to participate and gets the professionals of tomorrow interacting with the professionals of today.

The goals of the EC are to

- Involve students in the Pacific Northwest International Section Annual Conference of the Air & Waste Management Association

- Be a premier networking event for students to connect with internship and job opportunities.
- Provide experience in solving complex environmental situations in a fun and supportive atmosphere
- Give students opportunities to display their talents

Although winning solutions to the challenge must have sound engineering and technical bases, the solution generally does not require a full engineering design presentation. Similarly, all problems pose economic and political issues that must be addressed. Solutions are expected to provide reasonable resolutions applying basic engineering and scientific knowledge to research scenarios and critical questions.

Once teams reach the conference, preparation of broad background knowledge of the challenge topic will be the key to a successful competition. Role players in the EC problem will be identified and available for students to approach with questions and to consult for opinions. The role players are conference attendees and professionals in the environmental field. They provide a key interaction point for the EC participants by giving feedback on their solutions, asking questions to prepare the students for the project presentations, and enhancing the networking experience at the PNWIS Annual Conference. The role players also are critically involved in a "tweak" (added complication to the problem) that tests the students' knowledge of the challenge topic.

THE CHALLENGE

Development of natural resources is a key to Alaska's economy; it is a delicate balancing act between managing the benefits and costs from and to each resource. The quaint and historic town of Salmon, Alaska is a town that thrives on the seasonal salmon runs spawning in nearby tributaries and streams. Fry S. Alamon, an Alaskan born-and-raised commercial fisherman, wants to open a new fish processing plant. This is the man who grew up hearing stories of his great-great-grandmother catching mythical-sized salmon the size of a small truck. Fry will continue to strive to keep the waters surrounding Salmon, Alaska cold, clean and clear, but wants to profit off of the strong salmon runs and supply delicious fish to the people of the city and the remainder of the world.

The perfect location for Fry S. Alamon's shiny new fish processing plant is conveniently located on Salmon Bay, which is approximately two miles from a national park. The building grounds are not directly visible to the City and have plenty of acreage to build the necessary infrastructure for the plant. A wharf will need to be built, in addition to the factory, to allow for offloading of the fishing boat directly to processing. As an added bonus there is low boat traffic in the surrounding waters that will make for easy access to the plant's new wharf. There is one historic building on-site that will likely be a usable building for parts of the factory. Mr. Alamon believes this is the perfect ticket to becoming a rich Alaskan businessman.

> "Alaskan salmon have long been the standard of excellence for salmon. Salmon Bay exporting fish to be processed has proved itself to be a lost opportunity for revenue for the local economy. The addition of a local fish processing plant will create stability to the local economy, and guarantee our products excellence." – Fish-Stick Enthusiast, Fry S. Alamon

There is seemingly only one catch to Fry's fishy plan – there are old mining tailings presently stored on site from the Far Rockaway Mine and Mill which is located on adjacent property about a mile inland from the proposed fish processing plant. The mine and mill closed in the early 1900's. The tailings are estimated at about 120,000 cubic yards and are located in an old tailings pond that was built adjacent to the shore. The berm between the pond and the ocean has eroded over time and the tails has extended into the bay. Historic, and non-productive, ways of mining for gold were only able to refine approximately 50% of the gold within the ore deposit. "Highly accurate" estimates suggest there are upwards of 3 oz. per ton of gold remaining in the underutilized mine tailings.

Alaska has been called "the last frontier" and has been idolized for its opportunity for wealth and prosperity in the mining industry. As early as the late 1800s people have pressed their luck searching for minerals, specifically gold, hoping their prospecting would pay the bills. Arthur U. Goldman is one of those young, enthusiastic entrepreneur-types who is taking his name to heart. He believes that the tailings from the historic Far Rockaway Mine have plenty of gold to fund his lavish lifestyle and fuel his economic aspirations. A.U. Goldman's private company, Gold Diggers, LLC, has conveniently made a deal with Fry S. Alamon to re-process the tailings and dispose of the remaining materials before the fish processing plant is built. Over the years the tailings have drifted from the storage area into the bay. Fortunately for Goldman, half of the tailings are still above the Bay's waterline where they are accessible for re-processing.

> "Gold Diggers, LLC looks forward to the opportunity to quickly process the remaining tailing to aid in the development of a local fish processor. We foresee no issues with our use of current technologies to harness the full volume of gold remaining in the tailings pond and

> will deliver the land in a timely fashion for Mr. Alamon to build his plant."- Gold Lover and Aficionado, Arthur U. Goldman

The permitting for the fish processing and tailings reclamation project has been a bit contentious. Some in the community are extremely concerned for the area's future with the addition of more industry.

> "These projects will help our local economy, but it can't be all about the money. We have to look at the effects on the environment from reprocessing mining tailings that are likely contaminated with heavy metals, the increased fugitive dust from mine traffic and processing, as well as the increase of NOx emissions from boilers for the fish processing! Boat traffic is also surely set to increase which can't be good for any of the marine life or nature enthusiasts! Before we decide it must be determined how to mitigate the risk to our environment." – Concerned Environmental Advocate, Seymour Trees

The reprocessing of the tailings and construction of the processing plant needs to be coordinated as quickly as possible while jumping through the necessary bureaucratic hoops of the government while still making sure to appease all stakeholders. The fate of Salmon Bay depends on this projects careful planning and implementation.

Your Assignment

Fry Alamon has hired you, a team of renowned and unbiased environmental consultants, to create and proposal that addresses how, who, what and some whys regarding the regulatory and public concerns in construction of the fish processing plant and re-mining of the tailings. This plan will be a proposal that will guide decision making as the City and Alamon push the project forward in negotiations with the Regulatory Oversight Committee. To be successful in your presentation, you must tactfully and eloquently articulate issues, knowns, unknowns, and recommendations for the completion of this project.

There is no easy answer that will please everyone completely. You must do your best to build public support and articulate how to address the concerns of community groups and ensure the project provides the most tangible environmental, economic, and social benefits.

At a minimum, you should keep these in mind and address these questions in your solution:

1. What types of permits are needed for the re-mining of the tailings and construction of the new facility?
2. What types of contamination may be present in old tailings?
3. What efforts will be made to mitigate pollution and contamination from all potential sources?
4. What are possible impacts to the residents nearby from both portions of this project?
5. What will be done with the old tailings when S. Alamon and A.U. Goldman are through with the reprocessing?
6. How will all impacts be mitigated?

The Expectation

Numbers are not what is most important – logic train, process, conceptualizations, and creativity are the most important considerations for your proposal and presentation. As you may notice, and as we have intended, you have not been given all the information you might require or desire to solve this problem Such is life.

We encourage you to make assumptions, but you must be ready to defend them and pass the "straight-face" test. Keep in mind this is a competition and every team may make assumptions with the given information differently. Remember the fundamental principle for success on any project is to KISS (keep it simple stupid). You will be expected to present your thoughts in a public forum: eloquently, succinctly, and persuasively.

A note on professionalism: You will notice that a bit of humor is woven into this problem. PNWIS's traditionally keeps the EC light so students have fun. We encourage you to do the same. That being said, choose wisely the humor you wish to employ.

The judges are a collective of professionals ranging from those who are young and early in their career, to those who are heads of companies and presidents of national organizations. You are under the microscope by an eclectic group of individuals, so keep it tasteful and be respectful.

The Proposal

Submit your teams proposal by **5 pm (Alaska Time) on Friday, September 30th, 2016** via e-mail to ijackson@doyonutilities.com and Melody.Kieneker@erm.com.

The proposal should outline the team members by name and assumed project role (e.g "David Bowie" is going to be engineer and will address waste issues, "Carl Sagan" is going to be your air quality expert and thermodynamics enthusiast, "Frederick Law Olmsted" is going to be your landscape architect, and "Kermit" is going to be your urban planner and sustainability champion). The proposal should illustrate the technologies and strategies your team has identified along with a clear approach of how you will be implementing them.

The Tweak

No matter how much you do and know, in real life unexpected events and expectations can and do occur. To this end, expect some late-breaking information that might alter your approach and require your plan to evolve, perhaps substantially. The problem and the tweak will require that you find and talk to "experts" and attend various presentations during the conference for answers and important information. Details on where you need to be to interact with key players will be provided on the first day of the conference. Remember, those who are most successful in the "real world" are those that can identify what resources they have and use them. You are at a professional conference, what resources do you have?

When you submit your proposal, you will receive the Tweak via email prior to the conference. The sooner you get in the proposal the sooner you get the Tweak, but the earliest you will receive the tweak is September 30th.

Good luck and have fun!

PROTOCOL

Pay close attention to the protocol and follow the rules to a tee. This is a game of points. The proposals need to follow the guidelines established in the Protocols listed below.

The Presentation

Your team will need to demonstrate your understanding of the issues that you addressed in your proposal. You must include not only your key elements from your proposal, but also demonstrate adaptive management in dealing with the tweak. Sustainable approaches for these and other site issues are of great interest to most stakeholders. The winning team presentation will be strong in logic, clarity, application, and creativity.

Each team will present their solution on Friday morning on October 7th, as part of the conference. When we know how many schools will be presenting we will develop a schedule, but plan on presentations beginning at 8:30 AM and concluding an hour before the Awards Luncheon. PNWIS will have a projector and a laptop (with Microsoft Power Point). Please bring a USB flash drive so we can transfer your presentation to the laptop prior to the presentation. Plan for no more than 15 minutes of presentation followed by 5 minutes of questions and answers. You will be timed and the 15 minute rule is strictly enforced.

Each team must send an e-mail to Isaac Jackson and Melody Kieneker stating your intent to compete (ijackson@doyonutilities.com and Melody.Kieneker@erm.com). This e-mail will serve as your enrollment in the EC competition. The e-mails addresses that enrolled the teams will also be used to deliver information of any changes prior to the competition. If you have questions, submit them to Isaac Jackson and Melody Kieneker. Answers to the questions will be sent out to all teams.

Each team member must register for PNIWS Annual Conference in addition to stating their intent to compete. See conference website for registration links. (http://www.pnwis.org/annualconference/).

EC Competition Preparation

Student teams should start to form immediately following posting of the problem identifying and recruiting representatives from appropriate disciplines as needed to address the problem holistically. Just as corporations and other organizations pull together teams from their staff to most effectively address any given project, so too should each student team. Student teams may not contain more than 5 members and are generally comprised of 3 to 5 individuals.

Eligibility

The EC competition is open to all students who are registered for the PNWIS Annual Conference and have not been out of school for more than one full year. The competition will be a combined event for graduate and undergraduate students competing equally.

Expectations for proposed problem solutions

Solid technical analysis, logic train, process, conceptualizations, and creativity are all critically important to the proposal and presentation composition. Clear and concise presentation of your thoughts in a public forum is paramount to success.

Written Proposal Guidelines

Each team must submit a written proposal prior to the PNWIS Annual Conference on September 30th 2016 by 5pm (Alaska Time) addressing the problem. The written proposal should provide an outline of the approach that your team is going to take, the issues that you will be discussing and shall not exceed 3 pages (Not including Title Page and up to 3 diagrams, tables, or figures). Please do not forget to include your school, names and roles of each team member.

Proposal formatting guidelines include the following:

- 10 Pt Font (Times New Roman or equivalent)
- 1.5 Line Spacing
- 1 Inch Margins
- Divide your proposal into ordered sections
- Reference in text must be fully cited at the end of the proposal.
    - Example:
        - Reference in text – (Kuhn, 1962)
        - Full reference at end – T. Kuhn. The Structure of Scientific Revolutions (University of Chicago Press, 1962), pp. 27-42

Penalties for breaches in protocol:

- Late Submittal (5 Points Per Day)
- Failure to Register with both Isaac Jackson and Melody Kieneker prior to proposal submittal (5 Points)

- Deviating From Formatting Guidelines (3 Points Per Infraction, up to 15 Points)
- Failure to Interview all Roll Players (Up to 10 Points Per Roll Player, at Roll Players Discretion)

Role Players

During the conference you will be required to speak with role players involved with the problem. These role players will be project proponent(s), regulators, politicians, activists and other expected or unexpected individuals critical to creating a solution to the problem. Role players will offer insight and clarify any additional questions each team may have in relation to the problem. Please use professionalism during all business meetings, technical and plenary sessions, have fun while remembering your environment. While these role players are critical, so are the technical sessions and exhibitors that are related to the problem.

An orientation meeting for the EC participants will be held on Wednesday, October 5, 2016 (exact time and location will be identified in the conference program). Role players in the problem will be identified during the Wednesday meeting

Competition Finale - The Presentation

For the final presentation, teams must demonstrate their understanding of the issues in the written proposal and address the tweak. A multi-faceted approach is essential. The solution must address technical, social, and environmental issues.

The winning team presentation will be strong in approach, logic, clarity, application, and creativity.

Each of the teams will present their problem solution on Friday, October 7th, 2016 from 8:30 a.m. to 12:00 p.m. during the conference technical session program that day. A computer and projector will be provided for the presentation (with Microsoft PowerPoint). Please bring your presentation on a USB flash drive to be transferred to the computer. Plan for a 15-minute presentation followed by 5 minutes of questions and answers. The 15-minute presentation limit is strictly enforced. Please practice accordingly.

Winners will be announced at the Honors and Awards Luncheon on Friday, October 7, 2016.

Good luck and have fun!

EC Timeline

End-April, 2016: EC Problem Posted

September 30, 2016: EC Proposal due by 5 pm AK Time

September 30 - October 3, 2016: Tweak Sent to Teams after Proposal Submitted

October 5-7, 2016: PNWIS Annual Conference

October 5, 2016: EC Orientation (Location & Time TBD)

October 5-6, 2016: Interactions with EC Role Players

October 7, 2016: EC Presentations (08:30 AM)

October 7, 2016: Honors and Awards Luncheon (12:00 PM)

If scheduling dates, times, or locations change all participants will be notified as soon as possible.

Submit Proposals and questions to:

Isaac Jackson and Melody Kieneker

ijackson@doyonutilities.com and Melody.Kieneker@erm.com