AGENDA Day 2

Managing Uncertainty with Systematic Planning: (Developing Defensible Sample Designs for Environmental Decision-Making)

8:00 AM to 5:00 PM

8:00 AM – 8:15 AM **Module 7: Introduction & Agenda and Objectives**
Presenter: Sebastian Tindall
This module briefly discusses the DOE and EPA missions to institutionalize a Systematic Planning Process throughout the DOE complex and EPA Regions and provides an overview and presents the day's agenda, the objectives of each of today's 5 modules and 4 exercises.

8:15 AM – 8:45 AM **Module 8: Planning Implementation Process Flow and Wall Charts**
Presenter: Sebastian Tindall
The work process flow diagram for implementing the Planning Process is discussed. Pivotal elements of this process are getting the key decision-makers involved both early and often, and keeping meetings to a minimum.

8:45 AM – 9:15 AM **Exercise 0 – Introduction to Statistical Concepts: Demonstrations**
Presenter: Sebastian Tindall
Fundamental concepts necessary for the understanding of managing uncertainty and development of statistical sampling designs are presented to the students in the form of "hands-on" demonstrations, slides, and computer simulations.

9:15 AM – 9:30 AM **First Morning Break**

9:30 AM – 10:30 AM **Module 9: The Systematic Planning Process (Step 1 – State the Problem)**
Presenter: Sebastian Tindall
This module presents the Planning Process in detail, with both general and specific examples. Each step is discussed in terms of the information that is needed to begin the step, the actions that need to be performed, and the information that is needed to conclude a given step and begin the next step. Step 1 is covered in this Module.

10:30 AM – 11:30 AM **Exercise 1 – Populations, Histograms, Range, & Simulations**
Presenter: **Sebastian Tindall**
This exercise introduces a bag of 450 colored beads to represent a target contaminant population. Students will take a sample of five beads and construct a histogram and find the sample range. Data will also be combined to observe what happens when the sample is 50 beads. Computer simulations provide the results of repeated sampling.

11:30 AM – 12:00 PM **Module 10: The Systematic Planning Process (Step 2 – Identify the Decisions)**
Presenter: Sebastian Tindall
This module presents the Planning Process in detail. Step 2 is covered in this Module.

12:00 PM – 1:00 PM **Lunch Break**

1:00 PM – 1:30PM **Exercise 2 – Hypothesis Testing for Alpha Error Using X-Bar**
Presenter: Sebastian Tindall
Students conduct hypothesis tests on samples of beads using the sample average as the test statistic. Students will gain understanding of alpha error rate. This exercise provides a hands-on example of a typical alpha error rate. Computer simulations will illustrate this exercise.

1:30 PM – 2:15 PM **Module 11: The Systematic Planning Process (Step 3 – Identify Inputs)**
Presenter: Sebastian Tindall
This module presents the Planning Process in detail. Step 3 is covered in this Module.

2:15 PM – 2:30 PM **1st Afternoon Break**

2:30 PM – 3:00 PM **Exercise 3 – Hypothesis Testing for Alpha Error Using the 95% UCL**
Presenter: Sebastian Tindall
Students conduct hypothesis tests on samples of beads using the 95% UCL as the test statistic. Computer simulations illustrate this exercise.

3:00 PM – 3:15 PM **2nd Afternoon Break**

3:15 PM – 4:15 PM **Module 12: The Systematic Planning Process (Step 4)**
Presenter: Sebastian Tindall
This module presents the Planning Process in detail. Step 4 is covered in this Module.

4:15 PM – 4:45 PM **Exercise 4 – Hypothesis Testing: Beta Error**
Presenter: Sebastian Tindall
Students conduct hypothesis tests on samples of beads using the 95% UCL as the test statistic. Here the true mean of the population equals the Lower Bound of the Gray Region and thus this exercise provides a hands-on example of a beta error rate. Computer simulations illustrate this exercise.