**Problem Statement :**

The project involves analyzing water quality data to assess the suitability of water for specific purposes, such as drinking. The objective is to identify potential issues or deviations from regulatory standards and determine water potability based on various parameters. This project includes defining analysis objectives, collecting water quality data, designing relevant visualizations, and building a predictive model.

**Understanding :**

Access to safe and clean drinking water is a fundamental human right, and it plays a pivotal role in maintaining public health and well-being. However, water quality can vary significantly due to natural processes and human activities. To address this, it's imperative to perform a comprehensive analysis of water quality parameters, identify potential issues or deviations from regulatory standards, and determine water potability based on these parameters.

**Design Thinking :**

In this phase, we will apply the principles of Design Thinking to solve the problem at hand. Design Thinking is an iterative process that focuses on understanding the needs of stakeholders and creating user-centered solutions. Here are the steps we will follow:

1. **Empathize:** Understand the perspectives and needs of stakeholders, including water quality regulators, public health officials, and the general public. Conduct interviews, surveys, or gather domain knowledge to gain insights into their concerns and requirements regarding water quality assessment.
2. **Define :** Clearly define the project objectives and scope. Establish the primary goal of assessing water potability and ensuring compliance with regulatory standards. Identify key success criteria and project milestones. Define the data sources and parameters that will be used for analysis.
3. **Ideate :** Brainstorm potential solutions for assessing water quality and determining potability. Explore various data sources and analytical methods that can be applied to this problem. Consider innovative approaches for data visualization and predictive modeling.
4. **Prototype :** Develop a prototype workflow that outlines the data collection, preprocessing, analysis, and visualization steps. Create a preliminary data visualization plan to present water quality data effectively. Outline a high-level plan for building a predictive model to assess water potability.
5. **Test :** Apply the prototype workflow to a small subset of the water quality data to test its functionality. Evaluate the initial data visualizations for clarity and effectiveness in conveying information. Assess the feasibility of the proposed predictive modeling approach.
6. **Iterate :** Gather feedback from stakeholders, data analysts, and project team members based on the prototype's performance. Refine the workflow, data visualization techniques, and modeling approach based on feedback and lessons learned during testing.
7. **Implementation :** Scale up the solution to analyze the entire water quality dataset. Implement the finalized data visualization and predictive modeling pipelines.
8. **Communication :** By Preparing comprehensive reports and presentations to communicate the project's findings, insights, and recommendations to stakeholders and the broader audience. Ensure that the analysis results are presented in an easily understandable and actionable format.

By following this Design Thinking approach, we aim to develop a robust solution for assessing water quality and determining water potability, with a strong focus on meeting the needs and expectations of stakeholders and regulatory standards.