

## DESIGN CONSIDERATIONS FOR GAS STORAGE SURFACE FACILITIES

John Dougherty

Washington Group International  
P.O. Box 5888 Denver, Colorado, USA 80217  
JOHN.DOUGHERTY@WGINT.COM

### Abstract

This paper explores some planning, design, and contracting helpful to realizing a productive surface facility for gas storage. The concepts are based on the experiences of multiple surface facility projects that include a range of strategies and requirements.

The Life Cycle concept is explored to show the main stages of the facility process, and the importance and benefits of adequate pre-Project Planning. Next, some Planning and Requirement issues, including Capacity, Expansion, Operability and Permitting are discussed with examples drawn from real projects. The phases and accuracy of the Cost estimation process are explained, and what is involved in a quality cost estimate. The design of a surface facility for gas storage requires a selection from many operational choices and several of these alternates are explored. Ultimately the facility must be built, and several contracting strategies are described which are available to the Developer/Owner.

### 1. INTRODUCTION

Underground storage of natural gas, whether in solution mined caverns or depleted reservoirs, is an increasing energy management option for many enterprises. The technical and financial aspects for planned storage programs receive our adequate attention because that's what our engineering and business training and background drives us towards. Sometimes, focus is given to the technical and financial aspects of a planned storage facility, but insufficient thought may be given to how the plans will be realized.

The thought for this paper was generated while working on one program that was in the middle of its development. For this program, there were reams of data about the deep