

**PACKAGE ID** - 001066SPARC00 HORSMIC

**KWIC TITLE** - Horizontal Salt Solution Mining Model

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**LIMITATION CODE** -COPY                   **AUDIENCE CODE** - LIM

**COMPLETION DATE** - 01/01/1994   **PUBLICATION DATE** - 01/01/1994

**DESCRIPTION** - The code HORSMIC was written to solve the problem of calculating the shape of hydrocarbon (gas or liquid) storage caverns formed by solution mining in bedded salt formations. In the past many storage caverns have been formed by vertically drilling into salt dome formations and solution mining large-aspect-ratio, vertically axisymmetric caverns. This approach is generally not satisfactory for shallow salt beds because it would result in geomechanically-unstable, pancake-shaped caverns. In order to produce a high aspect ratio cavern in the horizontal direction a more complicated strategy must be employed. This code was developed to implement such a strategy, and can be used to estimate the shape of the cavern produced by a prescribed leaching schedule. Multiple trials can then be used to investigate the effects of various pipe hole configurations in order to optimize over the cavern shape.

**PACKAGE CONTENTS** - Media Directory; Software Abstract; Media Includes Source Code, Object Code, Sample Problem Input Data, User's Guide;

**SOURCE CODE INCLUDED?** - Yes

**MEDIA QUANTITY** - 1 3.5 Diskette

**METHOD OF SOLUTION** - SANSMIC is a quasi 2-dimensional time dependent explicit code that uses an iterative solver to determine the flow distribution along a perforated pipe and subsequent salt solution mined shapes.

**COMPUTER** - SUN SPARC

**OPERATING SYSTEMS** - The Solaris UNIX system was used.

**PROGRAMMING LANGUAGES** - FORTRAN 77

**SOFTWARE LIMITATIONS** - Software delivered is limited to 100 mesh points but can be redimensioned to handle larger problems. English units (fps) must be used in the input data.

**SOURCE CODE AVAILABLE (Y/N)** - Y

**UNIQUE FEATURES** - This is the only program known which will solve stated problem at this time.

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**UNIQUE FEATURES - (CONT)**

**RELATED SOFTWARE** - HORSMIC must be linked with the DOE Laboratory Mathematical Library SLATEC (ESTSC 184), and puts out a plot file which is suitable for processing by the commercial plot package 'TECPLOT'.

**HARDWARE REQS** - No special requirements. Source code and executable require 400 kb RAM total.

**TIME REQUIREMENTS** - A typical cavern calculation takes about 20 minutes on a SPARC 2.

**REFERENCES** - A. J. Russo, 'A User's Manual for the Computer Code HORSMIC', Sandia National Labs. (SNL) Report SAND93-3841, 1/94; W. H. Vandevender, 'SLATEC Mathematical Subprogram Library, Version 4.1, SNL Report SAND84-0281, 4/84.

**ABSTRACT STATUS** - Submitted 9-14-95.

**SUBJECT CLASS CODE** - T

**KEYWORDS** -

COMPUTER PROGRAM DOCUMENTATION  
H CODES  
MINING  
STORAGE FACILITIES  
SHAPE  
SALT CAVERNS

**EDB SUBJECT CATEGORIES** -  
990200 422000

**SPONSOR** - DOE/RW

**PACKAGE TYPE** - AS - IS