

INCREASED OIL PRODUCTION AND RESERVES FROM IMPROVED
COMPLETION TECHNIQUES IN THE BLUEBELL FIELD, UINTA
BASIN, UTAH

Quarterly Report
October 1, 1998-December 31, 1998

By
Craig D. Morgan

Date Published: November 2000

Work Performed Under Contract No. DE-FC22-92BC14953

Utah Geological Survey
Salt Lake City, Utah

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, expressed or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government.

This report has been reproduced directly from the best available copy.

DOE/BC/14953-29
Distribution Category UC-122

Increased Oil Production and Reserves from Improved Completion Techniques in the Bluebell
Field, Uinta Basin, Utah

By
Craig D. Morgan

November 2000

DE-FC22-95BC14953

Prepared for
U.S. Department of Energy
Assistant Secretary for Fossil Energy

Gary Walker, Project Manager
National Petroleum Technology Office
P.O. Box 3628
Tulsa, OK 74101

Prepared by
Utah Geological Survey
1594 West North Temple, Suite 3110
Salt Lake City, UT 84114

TABLE OF CONTENTS

OBJECTIVES	1
SUMMARY OF TECHNICAL PROGRESS.....	1
Completion of the John Chasel 3-6A2 Well.....	1
Technology Transfer	3

OBJECTIVES

The objective of this project is to increase oil production and reserves in the Uinta Basin by demonstrating improved completion techniques. Low productivity of Uinta Basin wells is caused by gross production intervals of several thousand feet that contain perforated thief zones, water-bearing zones, and unperforated oil-bearing intervals. Geologic and engineering characterization and computer simulation of the Green River and Wasatch Formations in the Bluebell field will determine reservoir heterogeneities related to fractures and depositional trends. This will be followed by drilling and recompletion of several wells to demonstrate improved completion techniques based on the reservoir characterization. Transfer of the project results will be an ongoing component of the project.

SUMMARY OF TECHNICAL PROGRESS

Completion of the John Chasel 3-6A2 Well

The completion of the John Chasel 3-6A2 well (sec. 6, T. 1 S., R. 2 W.) is the third step in a three-well demonstration. The first two wells, Michelle Ute 7-1 (sec. 7, T. 1 S., R. 1 E.) and Malnar Pike 17-1 (sec. 17, T. 1 S., R. 1 E.) were discussed in previous quarterly reports. The Michelle Ute was planned as a high-diversion, high-pressure, three-stage recompletion. Each stage, or interval, was intended to span about 500 vertical ft (150 m). Mechanical problems prevented a valid test of this recompletion technique. The Malnar Pike recompletion involved isolation and stimulation of much smaller intervals and testing at the bed scale, or as close to bed scale as was practical. Production results are still erratic but some improvement in the oil production rate was accomplished in the Malnar Pike well.

The Chasel 3-6A2 well was drilled, perforated, acidized, and after limited swab testing, a portion of the well was cement squeezed and some of the beds were reperforated as discussed in previous quarterly reports. Figure 1 is a wellbore diagram showing the chronological history of the completion activities in the Chasel 3-6A2 well as of December 31, 1998. After reperforating and acidizing the well, the operator began swab testing again. The tubing became plugged with cement and rock. The operator discovered that the casing had partially collapsed at 15,573 ft and 15,354 ft, and a tight spot had developed at 14,700 ft. A cast iron bridge plug (CIPB) was set at 15,400 ft and cement was dumped on top to a depth of 15,355 ft. While swedging the tight spot the tubing parted, leaving a fish in the hole. The operator has been unable to retrieve the fish and swab testing continues to be hampered by tubing plugging problems. A CIPB was set at 14,670 ft and an attempt was made to complete the well from the one perforated bed above the CIPB. However, the oil rate was too low to be economical. The CIPB at 14,670 ft was removed and the operator is currently trying to mill up the fish.

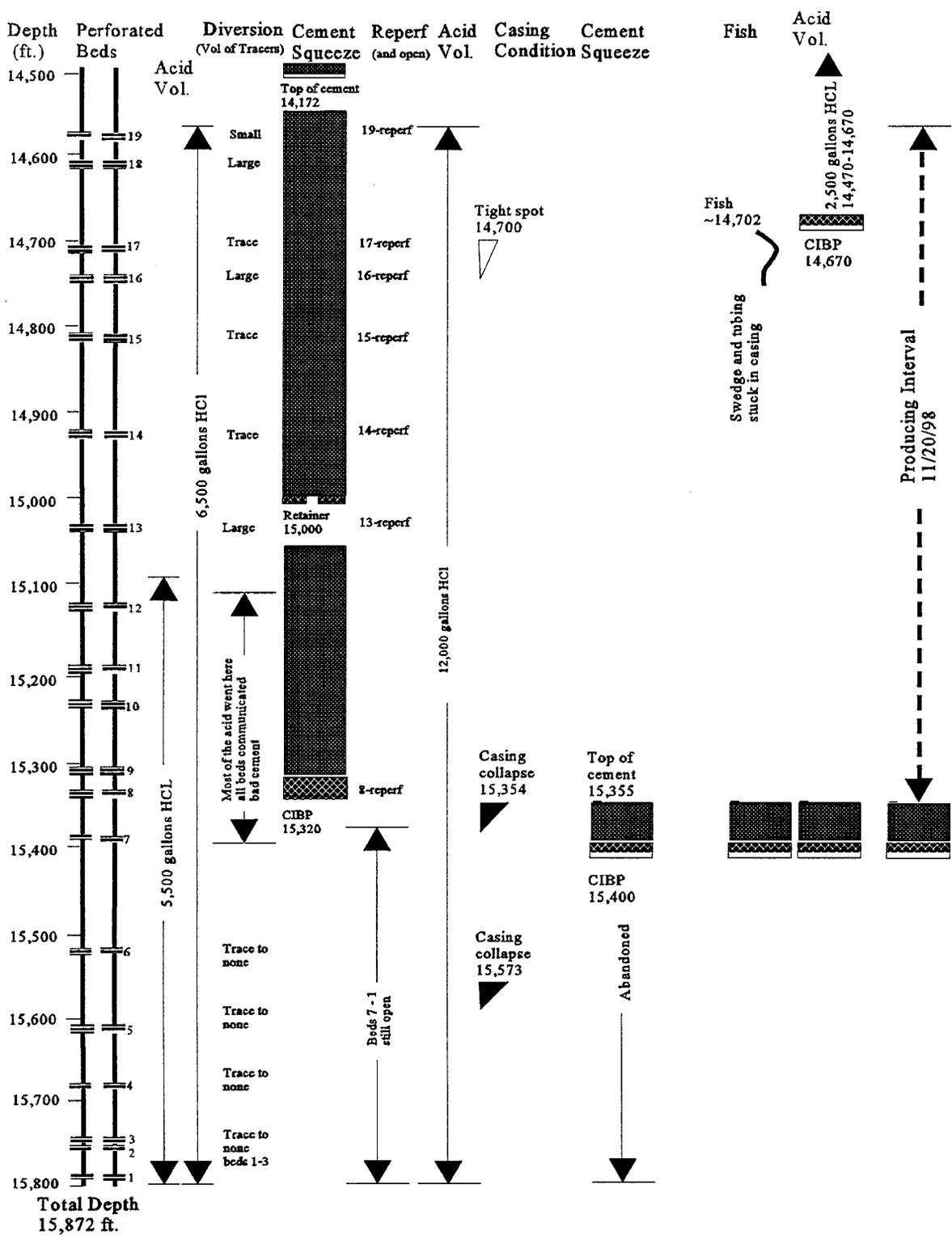


Fig. 1. Wellbore diagram of the Chasel 3-6A2 well showing the completion activities as of December 31, 1998.

Technology Transfer

The Utah Geological Survey hosted the Rocky Mountain Region of the Petroleum Technology Transfer Council's (PTTC) symposium entitled *Fractured Reservoirs: A Symposium on Current Research, Modeling, and Enhanced Recovery Techniques* in Salt Lake City on October 23, 1998. Milind Deo, Ph.D., presented a talk entitled *Fractured Reservoir Modeling in the Bluebell Field, Uinta Basin, Utah*, and Craig Morgan presented a poster entitled *Increased Oil Production and Reserves from Improved Completion Techniques in the Bluebell Field, Uinta Basin, Utah*.

The Utah Geological Survey displayed information about the project at the PTTC symposium and at the Interstate Oil and Gas Commission Compact meeting held in Salt Lake City, Utah, from December 6 through 8, 1998.

The Utah Geological Survey maintains a Bluebell home page on its web site containing the following information: (1) a description of the project, (2) a list of project participants, (3) each of the Quarterly Technical Progress Reports, (4) a description of planned field demonstration work, (5) portions of the First and Second Annual Technical Reports with information on where to obtain complete reports, (6) a reference list of all publications that are a direct result of the project, (7) an extensive selected reference list for the Uinta Basin and lacustrine deposits worldwide, and (8) daily activity reports of the demonstration wells. The home page address is <http://www.ugs.state.ut.us/bluebell.htm>

