

**X-Ray Diffraction Analysis
of
Metasideronatrite and Sideronatrite
From
Bass Basin, Australia
Cormorant No.1 Core**

**TPR
OR-0156**


Amoco Australia Petroleum Company

 (Inc. in Delaware, U.S.A., with Limited Liability - Registered
 as a Foreign Company in Tasmania)

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April 6, 1987

 South Australian Oil and Gas Corporation Pty. Limited,
 60 Hindmarsh Square,
 Adelaide. S.A. 5000

Attention: Dr. B. Devine

 Petroz N.L.,
 55 St. George's Terrace,
 Perth. W.A. 6000

Attention: Dr. J. Poll

 Bureau of Mineral Resources,
 Cnr. Constitution Avenue & Anzac Parade,
 Canberra. A.C.T. 2601

Attention: Mr. J. Staunton

Dear Sir,

 Re: Australia, Bass Basin,
 X-Ray Diffraction Data
MISC-AUP-144-L-341-JT

Enclosed please find three pages of x-ray diffraction data for Bass Basin cuttings samples removed from the Department of Resources and Energy Core and Cuttings Laboratory, Fyshwick in November, 1986.

This is the complete data set for the eleven core chips removed for mineral identification. There are no residual samples to be returned with these data. Portions of the core chips taken for mineral identification and for thin section examination will be returned upon completion of those analyses.

Yours faithfully,

C.W. Waring

C.W. Waring

JT/lrc

Encl.

MINES	
File Ref.	6/8
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Action Officer	Initials
PB	
Resubmit to	Date



156003

AMOCO PRODUCTION COMPANY
Tulsa, Oklahoma
March 6, 1987

87065ART0066

TO: N. L. Haskell

SUBJECT: X-ray Diffraction Analysis of Metasideronatrite and
Sideronatrite from Bass Basin, Australia, Cormoquant No. 1 Core
Sample depth 4275'

The grains of yellow material were placed in a mortar with acetone and handground to create a slurry. This slurry was sedimented onto a glass slide. An X-ray diffraction pattern was then run from 2 to 44° 2θ. Part of the sample was later removed and placed on a S.E.M. stub for further examination of morphology and chemistry.

The scanning electron microscope revealed the presence of abundant prismatic, orthorhombic-like crystals as much as 20 μm long. Elemental analysis showed major amounts of Na, Fe, S, and minor amounts of silicon, probably as quartz impurities. The complex diffraction patterns have major peaks at 8.04Å, 3.67Å, 3.98 Å, and 3.67Å that accord with metasideronatrite [Na₄Fe₂(SO₄)₄(OH)₂·3H₂O], and an array of less intense diffractions at 10.3Å, 3.35Å, 3.21Å, and 360Å that are consistent with sideronatrite [Na₂Fe₂(SO₄)₂(OH)·3H₂O]. Even though they are chemically similar, they have distinctive X-ray diffraction patterns. The possible presence of kaolinite, quartz, and feldspar is also indicated by X-ray diffraction. Kaolinite and quartz were confirmed by the S.E.M.

Inasmuch as both minerals seem to occur as efflorescences on friable core samples that were not sealed in plastic, they likely formed by "weathering" of iron sulfide (pyrite or marcasite?) in the unprotected samples. Solution-precipitation reactions probably would allow easy conversion of both metasideronatrite and sideronatrite to natrojarosite [Na₂Fe₈(SO₄)₄(OH)₁₂].

G. R. Powers

GRP:bl

REPORT No.

R590

MINERALOGY, INC.

3228 E 15th St
Tulsa, Oklahoma 74104

Norm Haskell

REPORT No:
8590

X-RAY DIFFRACTION MINERAL PERCENTAGES

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Job 87-75

156004

SAMPLE IDENTIFICATION NUMBER CORMORANT	QUARTZ	FELDSPAR	CALCITE	DOLOMITE	FERRODOLomite	SIDERITE	PYRITE	GYPSUM	AMPHIBOLE	AUGITE (?)	KAOLINITE	CHLORITE	ILLITE/MICA	MIXED-LAYER ILLITE/SMECTITE	MIXED-LAYER CHLORITE/SMECTITE			Plagioclase Feldspar	Feldspar K	TOTAL
4271'	72	2				16	2				8		trc	trc				2		
4279'6"	45					55	trc				trc									
4295'	89	trc				trc		3	2		6		trc	trc						trc
4938'	91	trc					trc				7	trc	2							trc
5538'	55	trc	trc	43							2		trc							trc
6551'	10					81	2				5		2							
PELICAN 3																				
7354'	86	2			trc	3					7		1	1				2	trc	
ANGLESEAS																				
1216'	86	trc				trc				trc	9		5					trc	trc	
1784'	87	3				trc					10		trc	trc						3

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Norm Haskell

MINERALOGY, INC.

3228 E. 15th St.
Tulsa, Oklahoma 74104Page 2 of 2

X-RAY DIFFRACTION MINERAL PERCENTAGES

SAMPLE IDENTIFICATION NUMBER	QUARTZ	FELDSPAR	CALCITE	DOLOMITE	FERRODOLomite	SIDERITE	PYRITE	GYPSUM	AMPHIBOLE	AUGITE (?)	KAOLINITE	CHLORITE	ILLITE/MICA	MIXED-LAYER ILLITE/SMECTITE	MIXED-LAYER CHLORITE/SMECTITE			Plagioclase Feldspar	Feldspar K	TOTAL
BASS 2																				
3809'A	trc		2	98																
3809'B	20			6		67	2				5		trc							
DUROON																				
8388'A	88	10					trc				2	trc	trc		trc				10	
8388'B	75	17									2	3	3		trc				17	
PELICAN 2																				
9929'4"	31	trc	1		57	8	trc				3		trc	trc					trc	
POONBOON																				
8103'	20					72					5		3							