

Attachment to WCR.  
Orange Roughy-1.  
W866.

DEPT. NAT. RES & ENV



PE907951





**PETROLEUM DIVISION**

**FTIR and XRD DATA**

**of**

**ORANGE ROUGHY-1 SAMPLES**

**for**

**ESSO AUSTRALIA LTD**

**by**

**ACS LABORATORIES PTY LTD**

**18 AUG 1995**

**FTIT and XRD DATA**  
  
**of**  
  
**ORANGE ROUGHY-1 SAMPLES**

A report prepared for  
  
**ESSO AUSTRALIA LTD**  
  
by  
  
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**AUGUST 1995**

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## 1. OVERVIEW

Esso Australia Ltd submitted four samples from Orange Roughy-1 for Fourier Transform Infrared Spectroscopy (FTIR). Mineral identification was also undertaken using qualitative XRD.

## 2. METHODS

### *Fourier Transform Infrared Spectroscopy*

A fraction of each sample was powdered in an agate swing mill. 1 mg of sample was then mixed with 200 mg of potassium bromide and pressed into a pallet. The infrared spectra were obtained on a Perkin-Elmer 1700 FTIR using Kbr absorption techniques with a nominal resolution of 4 cm<sup>-1</sup> over the 400 to 4000 cm<sup>-1</sup> spectra range.

### *X-ray Diffraction*

A portion of each sample was powdered in an agate swing mill. The unoriented powdered sample was scanned from 5° - 15° 2-theta at 0.5° per minute.

## 3. RESULTS

A summary of FTIR results are presented in Table 1 and XRD data in Table 2. Traces of XRD spectra are given in Appendix 1. FTIR indicates that:-

- The predominant clay is an expanded halloysite. The kaolinite is disordered and contains an illitic component.
- Samples 2314.35 and 2318.35 are identical except for water and organic content. Sample 2320.35 is the odd sample in that it contains almost no clay and is predominantly quartz with minor organics and water. Sample 2327.35 is the most clay-rich.
- Quartz and feldspar were quantified together because the dominant quartz peak masked the feldspar interference bands.

Sample No.	% Component					
	Qtz/feld	Halloysite	Kaolinite	Organics	Water	Others
2314.35	55	15	10	9	11	
2318.35	60	15	10	7	7	
2320.35	85	<3	<3	5	3	
2327.35	50	20	20	9	15	

**Table 1:** Results of Infrared Spectroscopic Analyses. Percentages are accurate to  $\pm 5\%$ . Note that quartz and feldspar could not be distinguished due to overlap of absorption bands.

Sample No.	Mineral				
	Quartz	K-Feldspa	Kaolinite	Illite	Pyrite
2314.35	High	Low	Low	Trace	Trace
2318.35	High	High	Low	Trace	Trace
2320.35	Very High	Low	Very Low	ND	Trace
2327.35	High	Low	Low	Trace	Trace

**Table 2:** Relative abundance of mineral detected by bulk and clay XRD. ND = not detected.  
Note: These abundances are subjective and were determined from qualitative XRD.

**APPENDIX 1**

**XRD Spectra**

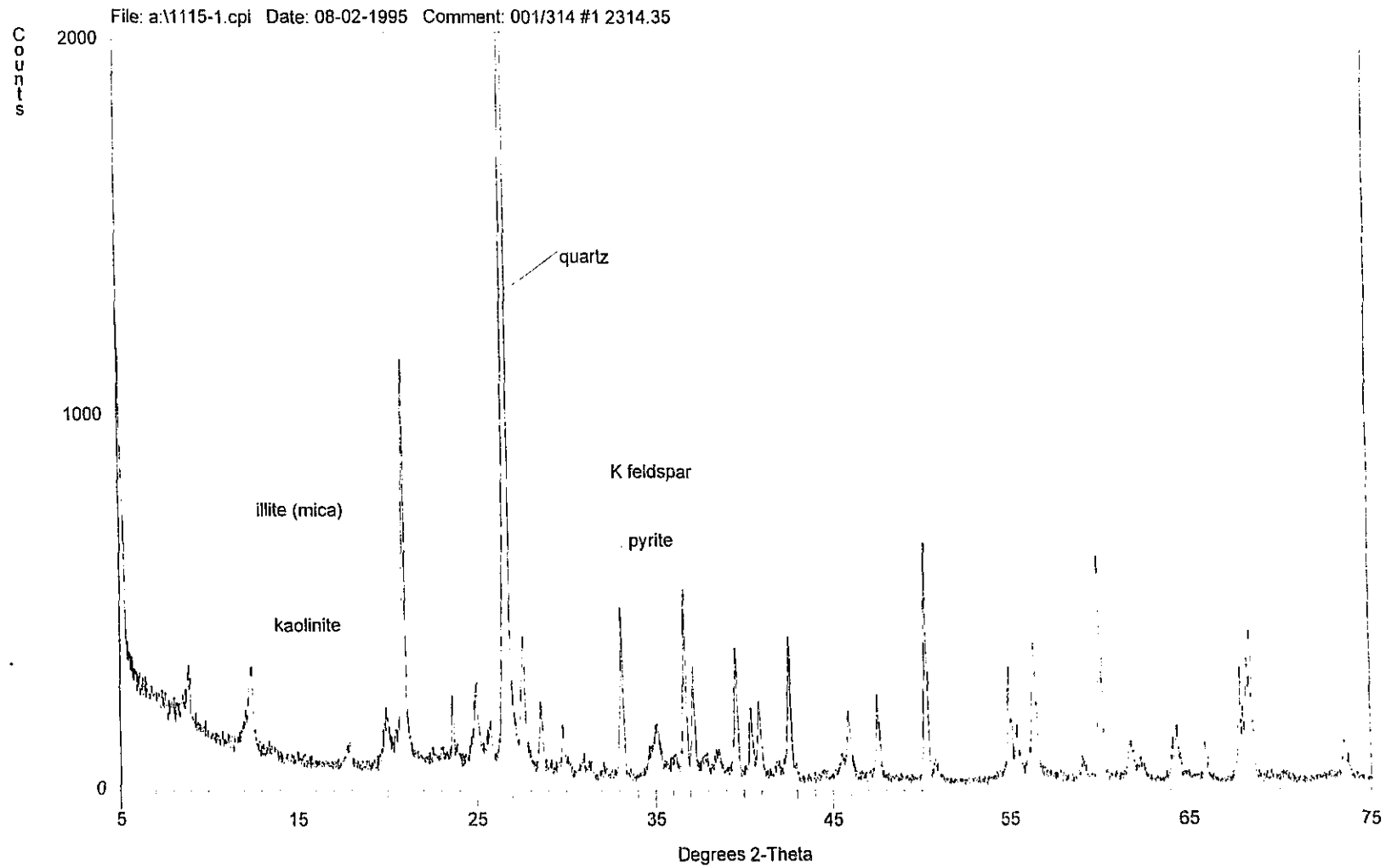


Figure 1: Sample 2314.35 m: Bulk XRD trace of powdered and unoriented sample.

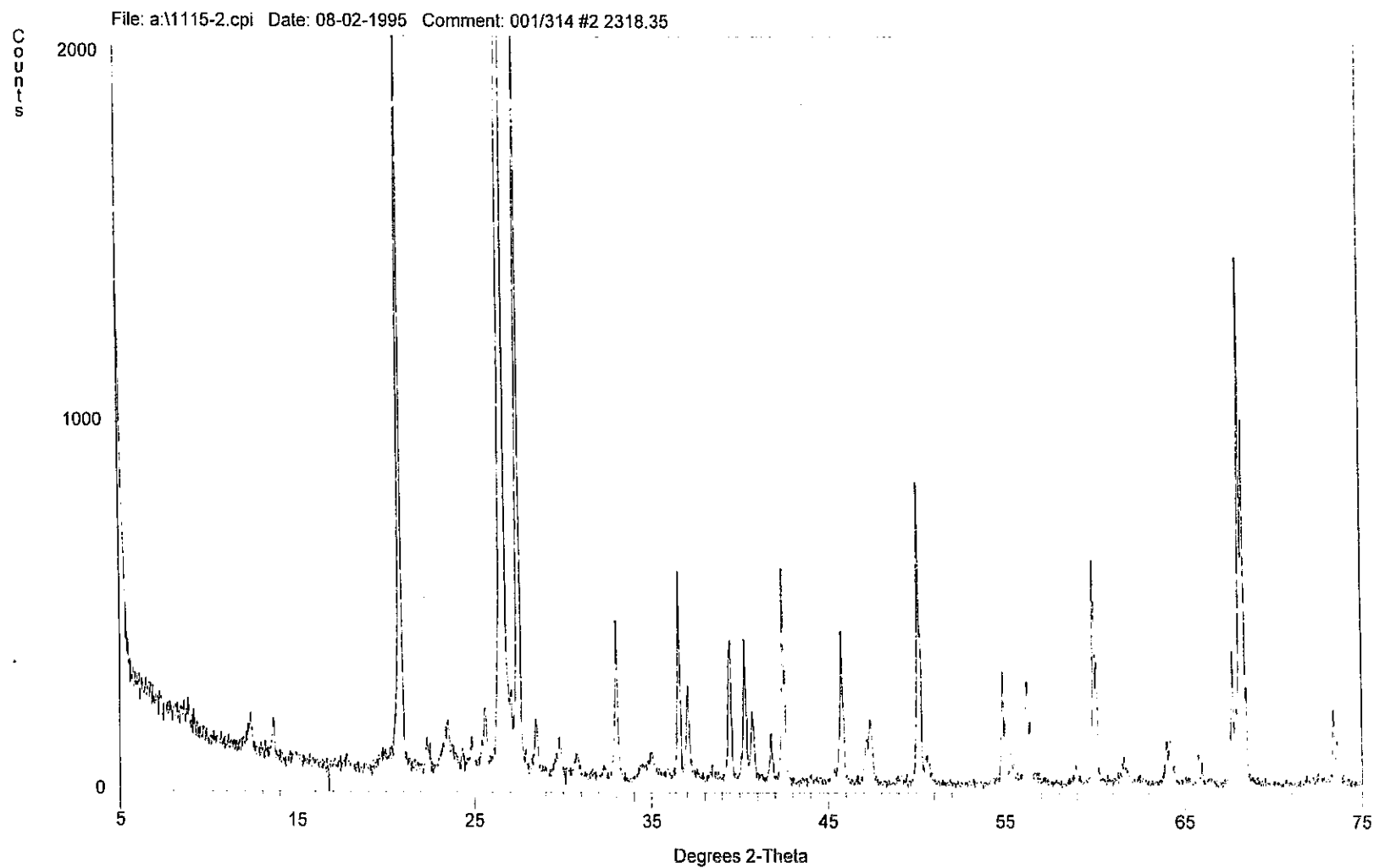


Figure 2: Sample 2318.35 m: Bulk XRD trace of powdered and unoriented sample.



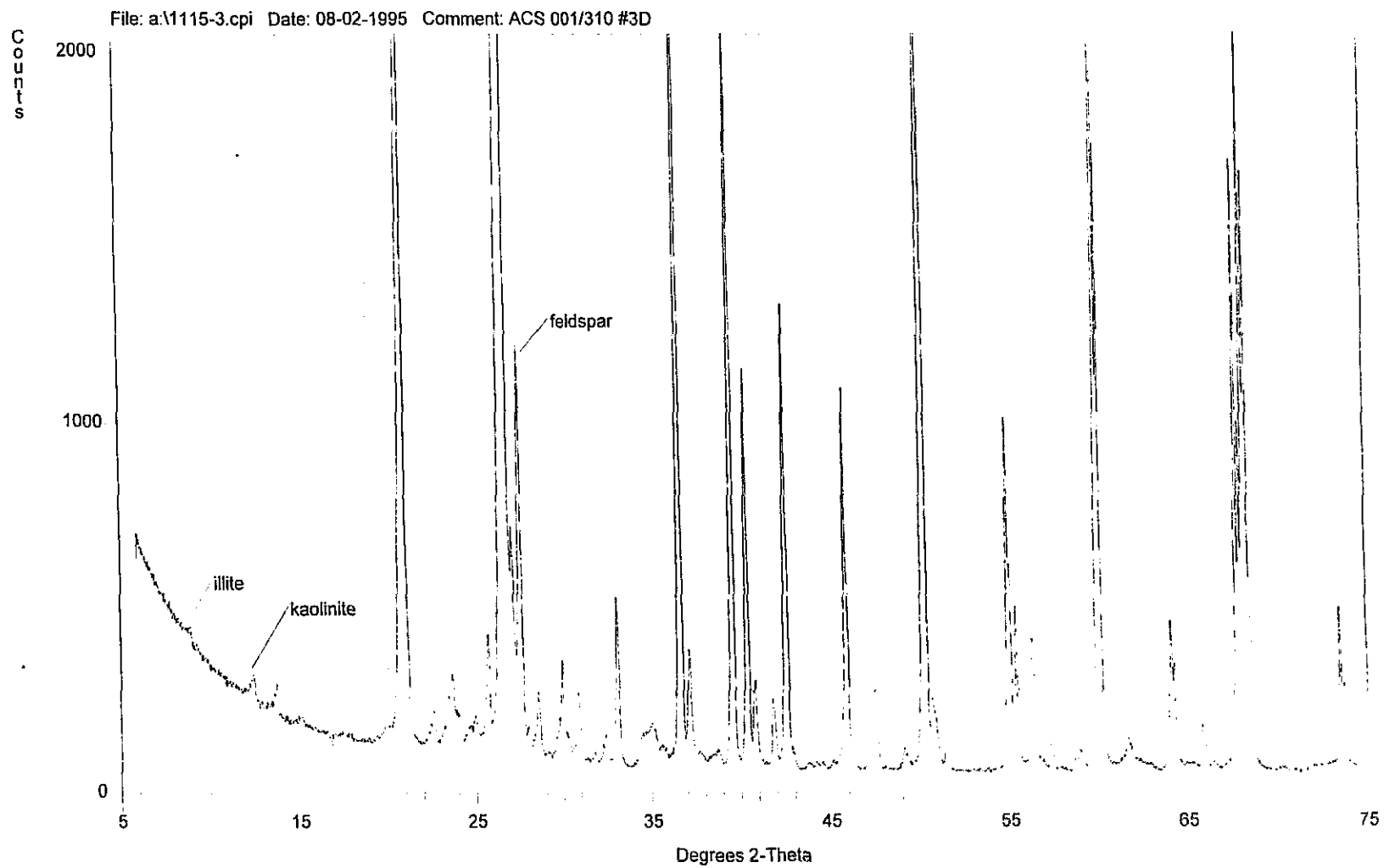


Figure 3: Sample 2320.35 m: Bulk XRD trace of powdered and unoriented sample.

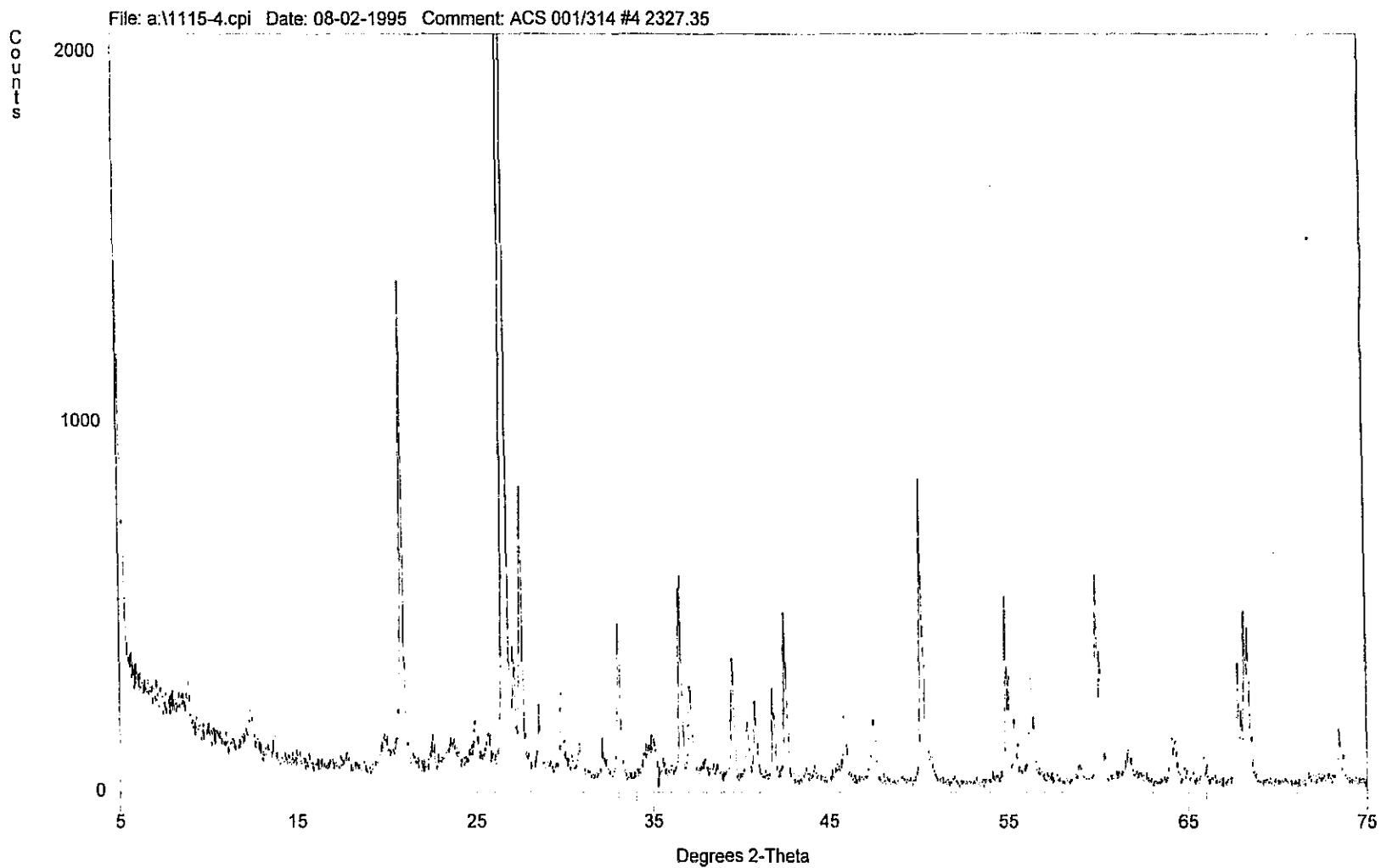


Figure 4: Sample 2327.35 m: Bulk XRD trace of powdered and unoriented sample.