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A hydraulically activated piston loaded test cell was used to investigate the parameters affecting formation damage in the Lower Cruse Sand Formation. The sand pack was prepared from a Lower Cruse outcrop located in the Point Fortin area and was based on sieve analysis of sidewall cores.

The investigation was conducted in a step-wise manner commencing with an X-ray diffraction analysis which revealed the presence of montmorillonite/illite mixed layer clay, a swelling clay. The sieve analysis showed that the reservoir sand contained 22 percent by weight of fine particles ( $< 53 \mu\text{m}$ ). Preliminary flow tests showed that formation damage was the direct result of clay swelling and fines migration and pore restriction plugging.

Formation damage resulting from fines entrainment and pore restriction plugging was a slow cumulative process. Core permeability was restored by backflooding. The skin factor/pore volume throughput relationship was linear with a positive coefficient of 0.22. The presence of chloride salts of either sodium, potassium, calcium or magnesium in the injection fluid prevented clay swelling but, on exposure to fresh water, core permeability was drastically reduced and the chloride salts had no definite restorative effect.

All gravel sizes used to investigate the simulated gravel packed sand bed showed exceptional ability to bridge the sand particles. This characteristic is partly attributable to the design of the core holder and the packing procedures implemented in the laboratory investigation.

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