PETROLEUM GEOLOGISCHE KRING

KONINKLIJK NEDERLANDS GEOLOGISCH MIJNBOUWKUNDIG GENOOTSCHAP PGK

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Venue:	PGK's monthly meetings are held at the KIvI building, Prinsessegracht 23, Den Haag. Drinks are served from 17:00 hrs; the lecture starts at 18:00 hrs.-.		**www.pgknet.nl**
Membership:	Apply for membership by contacting the secretariat. The annual fee is 15.- Euros.		
Accounts:	Fortis Bank: 88 65 82 733 (PGK, Den Haag)		Postbank: 4074482 (PGK, Den Haag)

DECEMBER 2003 NEWSLETTER

17 DECEMBER: MONTHLY MEETING

This month's PGK meeting will be on **Wednesday, December 17, 2003**. The lecture will be given by **Marc Budding** (BRG) with the title:

"Geological notes on Suriname"

Please see other side of this newsletter for the lecture abstract.
A Suriname-style buffet will follow. Please confirm soon by e-mail to secretary@pgknet.nl if you plan to attend.

JANUARY MEETING: It will be held on **Wednesday, January 21, 2004**. Title and lecturer will be announced at the upcoming meeting.

EXCURSIONS

The excursion program is still "under construction" but please put May 21-23, 2004 on your agenda as provisional dates for the PGK three days excursion.

NEW MEMBERS: Applications for membership have been received from Coen Leo, Jo van Buggenum, Peter Veenhof and Ruud van Boom (Wintershall), Peter Haalebos (consultant), Alastair Milne (NAM). If no objections are received prior to or during the next meeting, they are automatically admitted as members of our society.

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Monthly meeting: **Wednesday 17 December 2003**
Address: KIvI building, Prinsessegracht 23, Den Haag
Social hour: (free drinks) between 17:00 and 18:00 hrs
Lecture: at 18:00hrs

Geological notes on Suriname

Marc Budding (BRG)

The South American part of the Guyana Shield straddles the borders of Brazil, Venezuela and the three Guyanas. It consist of an Archean core of granulites and migmatites surrounded by several Early Proterozoic accretionary units, including a vast granitoid-volcanic complex and the Marowijne Greenstone belt, probably a vestige of an early Proterozoic plate collision.
Local remnants of once-extensive sheets of Roraima sandstones and volcanoclastics testify of regional subsidence and basin formation in Middle Proterozoic times.
No tangible traces remain from the following 1.5 billion years, when a swarm of Permo-Triassic dolerite dykes heralded the rift between the African an American Guyanas as part of the eventual break up of Gondwana.
It would however, take another hundred million years before a giant right-lateral wrench system was linked the then still unconnected North and South Atlantic rift basins Barremian times. Continuing transtension made room for upwelling mantle material to floor a new ocean basin: the Equatorial Atlantic. Transform margins formed on both sides. They are characterized by pull-apart basins, some filled with sediment, others with steeply foresetting sheets of basalt, large pop-up structures, almost coast parallel strike-slip faults with high aspect ratios and uplifted marginal plateaus like the enigmatic Demarara Rise.
Four factors control the formation and fill of the Guyana margin within this tectonic context: the cooling rate of the young ocean floor, supply rate of sediment, loading subsidence and the isostatic adjustment of the Guyana shield to unroofing by tropical weathering.
The proximity of a stable, low-relief hinterland with low sediment yield, would suggest a uneventful basin fill of relatively simple architecture. Subsurface data however show otherwise: five second-order tectonic sequences can be distinguished, separated by regional angular unconformities.
The ancient coastlines and shelves of the basin showed little resemblance to the low-energy, sand-starved shores of Surinam
Large, sand-rich deltas prograded over high-energy shelves during at least two episodes while the shelf-edge prograded over more than sixty kilometer into the basin during the Tertiary. This has important consequences for the hydrocarbon potential of the basin. In June 2000, the United States Geological Survey placed the Guyana - Suriname Basin second on the list of high potential under-explored basins in the world. Offshore wells have demonstrated the presence of thick Cenomanian-Turonian source rocks of a similar age and origin as the proliferous Canje source rock of East Venezuela. Oil from this source has migrated updip to accumulate in the Tambaredjo field onshore Suriname. Neither source nor reservoir appears to be a problem. More critical is the questionable presence and integrity of updip seals. This has a direct relationship with the sequence architecture in the basin.
Trapping and accumulation conditions in the Tambaredjo area were studied to provide more information.
The basic stratigraphic units within the tectonic cycles are fourth-order depositional sequences, bounded by erosive surfaces. Each sequence consists of three sediment associations: a basal, sand rich association, overlying and filling the erosive relief on the sequence boundary. These basal units contain most of the potential reservoir sands along the basin margin. The second association is formed by coastal plain deposits, which formed after the erosive relief had been filled and the constructive topography was restored. The main components are flood-basin fines and isolated river channel deposits. The third association consists of marine muds, deposited during sea-level high stands, when the coastal plains were flooded. They form continuous and extensive seals.
Preservation of these seals reflects the architectural style of the basin fill: at high subsidence rates, erosion at the sequence boundaries only affects the upper part of the underlying marine muds, leaving the seal intact. The low subsidence rates along the margin of the Guyana basin gave rise to deep erosion at the sequence boundaries. Thus a significant proportion of the marine and coastal plain associations was removed after every cycle, leaving little more than discontinuous remnants of the one extensive seals. In the Guyana Basin subsidence increases basinward and the architectural style changes accordingly.

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