



## **EPL 2499 (Block J)**

# **TARGET AREAS FOR EVALUATION SAMPLING as at JANUARY 2010**

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## **1. PREAMBLE**

Block J is Exclusive Prospecting Licence (EPL) number 2499, covering about 1000 km<sup>2</sup> of the Namibian continental shelf, about 120 km north of the town of Luderitz. Afri-Can Marine Minerals Corporation (“Afri-Can”) holds a 70% interest in the EPL by virtue of a joint venture agreement with the licensee, Woduna Mining Holdings (Pty) Ltd.

Work in the EPL commenced in 1999. In May 2006, Afri-Can published a Canadian NI 43-101 report covering the analysis of all exploration work done to date, and stated a potential of between 0.6 and 1.6 million carats of diamond mineralisation in a ribbon-like strip totaling about 11.5 km<sup>2</sup> in area. It was noted that additional areas, in valleys in the Precambrian basement, had also been shown to be mineralised.

Those statements were based on the geological models in force at the time of writing, which had been interpreted from initial geophysics and sampling done in 2000, 2001 and 2002. Since that time, a considerable amount of geophysical survey and vibracoring work has been done, and the intense and ongoing interpretation, compilation and comparison of results has resulted in enhancement of the geological models, and changes to the delineation and definition of target areas for sampling. The purpose of this report is to review all work done subsequent to May 2006, to document the principle developments of the geological models, and to clearly define the target areas for sampling as they exist in December 2009. This is part of the preparations for evaluation sampling, which is expected to be carried out early in 2010.

## **2. SUMMARY OF WORK SINCE MAY 2006**

### 2.1 Geophysics and Vibracoring - 2006

In October and November of 2006 a detailed geophysical survey was undertaken in Features 06, 08, 17, and 19, using the vessel m.v. ‘Mare Oceano’ contracted from the company International Mining and Dredging Holding (IMDH). A total of 1353.6 line-kilometres was traversed, and a variety of geophysical instruments were used. The Side Scan Sonar and Multibeam echosounder produced good high resolution information about the sea bed. The Sparker profiler gave fair results for the first few tens of metres below the sea bed, but the resolution of detail was low, as designed, because of the low frequency of

the acoustic pulses. The results of the Pinger shallow sub-bottom profiler, designed to have shallow penetration but high resolution, were very disappointing.

When weather permitted, geophysical operations were suspended in favour of vibracoring, to “ground-truth” the geophysics and to provide material for determination of geological ages and paleo-environments. 36 vibracores were recovered.

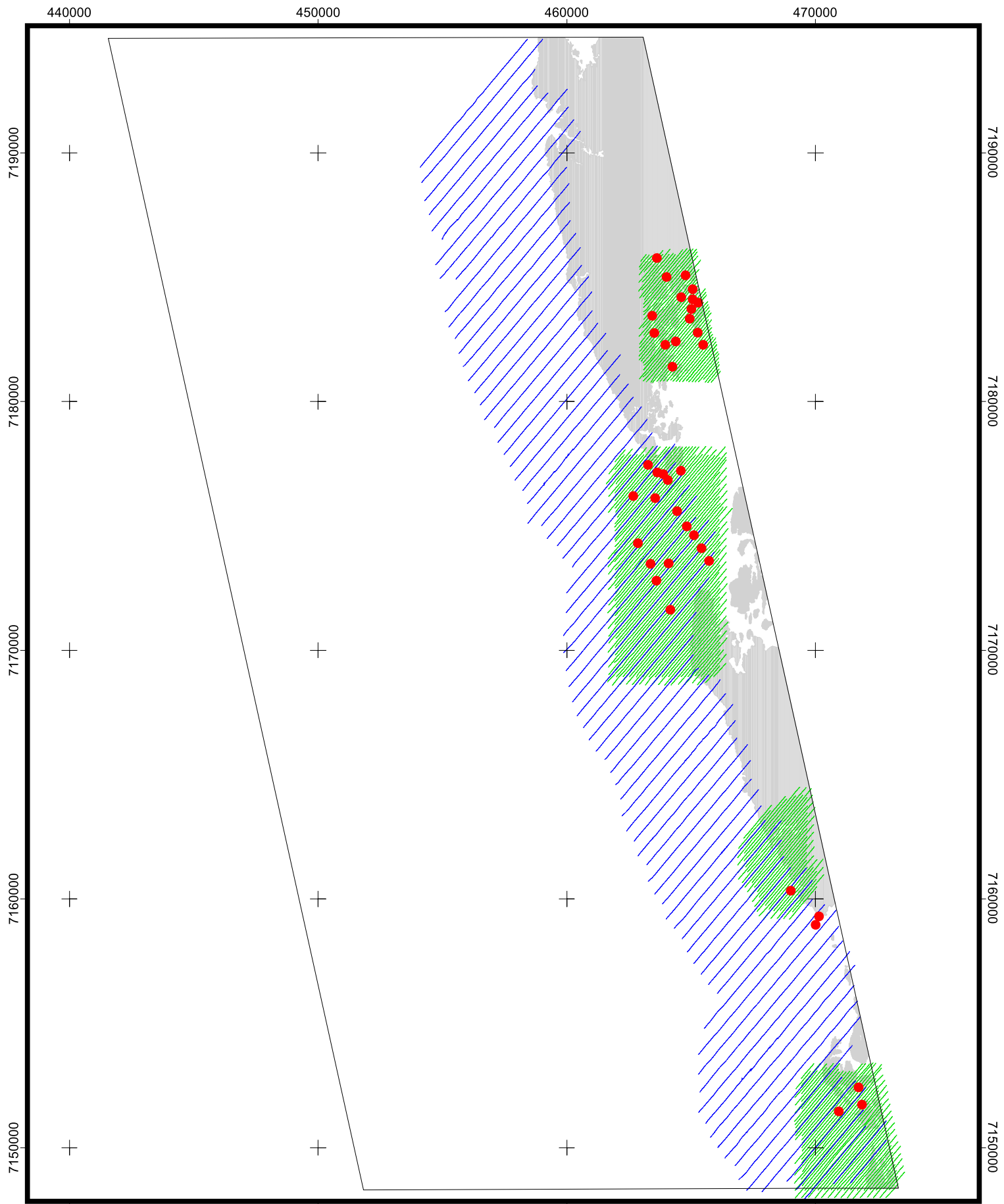
## 2.2 Regional Topas Survey - 2007

In April 2007 a regional survey was conducted, again using the m.v. ‘Mare Oceano’, to test the capability of a Topas geophysical profiler, designed for high resolution and moderate penetration, in the geological conditions in Block J. This was done for the account of IMDH, following the poor results of the Pinger in the 2006 surveys. Afri-Can personnel were not on board the vessel during the survey, but the raw geophysical recordings were later made available to the Afri-Can technical team for processing and interpretation. Map 1 shows the geophysics tracks of both the 2006 and 2007 surveys, and the vibracore positions.

The quality of the results of the Topas trials was mixed. In some areas good penetration and reasonably high resolution was achieved, but elsewhere the record quality was poor (Fig. 1). It is thought that the variation in results was caused largely by deteriorating weather conditions during the survey, possibly combined with non-optimum equipment settings, rather than by variations in local geology.

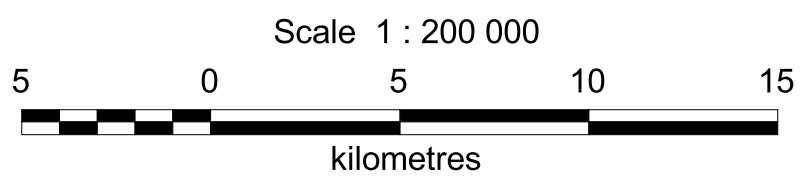
## 2.3 Zstar Contract - 2009

In May 2009, Afri-Can signed an agreement with Zstar Mineral Resource Consultants (“Zstar”) for the latter to act as independent auditors and resource estimators from the results of the 2010 evaluation sampling, as required by NI 43-101 rules. As part of this process, Zstar carried out an independent review of the proposed sampling programme and made certain recommendations, which were adopted by Afri-Can. These changed the target areas slightly, as detailed below.



Map 1. 2006 & 2007 Surveys

- 2006 detailed surveys
- Vibracores
- 2007 Topas survey
- Basement outcrop
- Block J



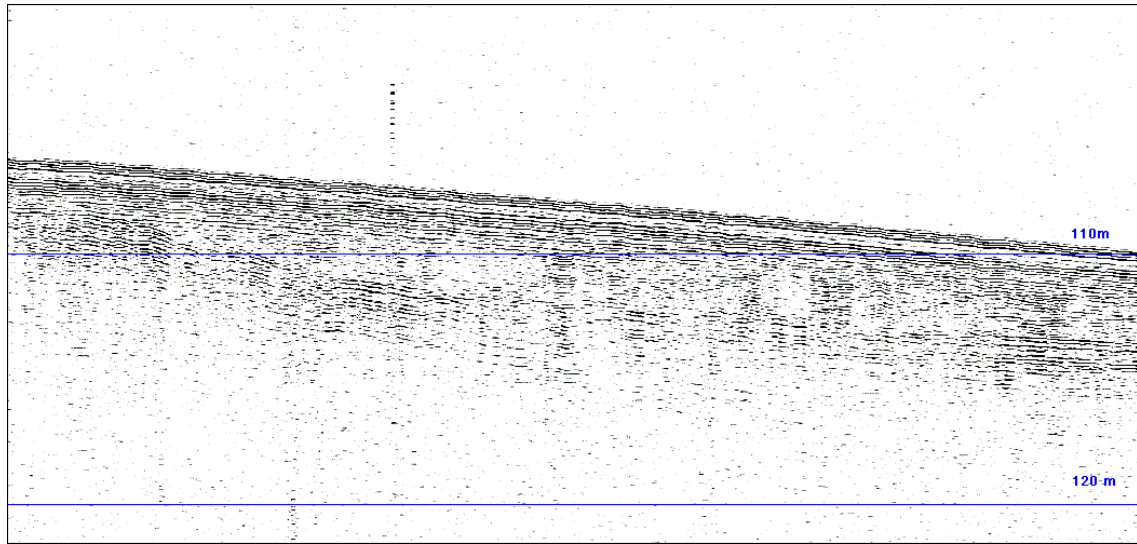


Fig 1A – An example of a fair to good quality Topas record, processed and filtered from the raw signal to give optimum results. Penetration is 8 to 10 metres and details of the sub-seabed strata can clearly be seen.

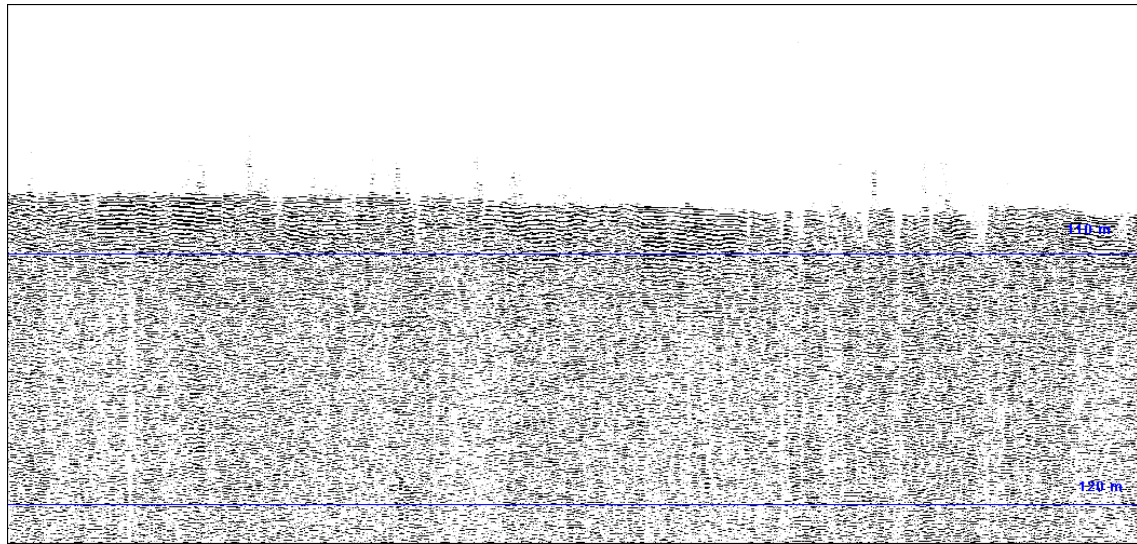


Fig 1B – An example of a poor quality Topas record, processed and filtered from the raw signal to give optimum results (same settings as Fig 1A). The signal is discontinuous, the seabed is indistinct and very little sub-bottom information can be gleaned.

**Fig 1 – Examples of Topas Records**

### 3. DEVELOPMENT OF GEOLOGICAL MODELS

#### 3.1 Geophysics and Vibracoring - 2006

Analysis of the 2006 geophysics and vibracore results led to a major review of the geological models. Previously, in the absence of dating information and using low resolution geophysics, the abovementioned mineralised 11.5 km<sup>2</sup> strip was thought to be a ribbon of lag gravel deposits adjacent to the outcrop of diamond-bearing conglomerates of early Tertiary (Eocene?) age. It was also thought that there had been development of longitudinal “gravel waves” during Pleistocene low sea levels, and these were considered potentially diamondiferous.

The high resolution 2006 geophysics results showed that within Features 8, 17 and 19 there is indeed a ribbon-like strip of material, and it was inferred that this probably extends the whole length of the EPL. However, the vibracores showed that instead of being thin lag gravels, the deposit consists of mixed colluvial and terrestrial (“TC formation”) material up to at least 6 metres thick in places, dating from the last glacial depression of sea level about 30 000 to 20 000 years ago. Previous sampling in 2001 and 2002 has shown that this deposit contains diamonds.

Dating of the vibracore material also showed that the adjacent conglomerate, from which much of the TC formation is derived, is not Eocene but is Miocene in age. Eocene material was detected filling the major basement valley to the north-east of Feature 8. The vibracores and high resolution side scan sonar also showed that the seabed textures that were thought, from the low-resolution 2000 side scan sonar survey, to be gravel waves, are in fact the subdued outcrops of indurated horizons within a package of Miocene sediments that occur to the west of the basement outcrop and have the conglomerate unit at their base.

The 2006 survey results and vibracores also showed that the LTS gravel formations are quite extensive in the valleys of Features 6, 17 and 19, totalling 10.7 km<sup>2</sup> in area, including a small patch in Feature 8. Outside of those four features the 2000 geophysics results suggest an additional 4.9 km<sup>2</sup>, principally in valleys similar to those in Features 6 and 19. The 2001 sampling recovered one diamond from such a valley in Feature 1. The total area of potentially diamondiferous LTS gravels is therefore 15.5 km<sup>2</sup>.

The above findings resulted in the revision of existing geological models and several reports covering the geology of the seabed and sub-seabed in Block J were published. A summary NI 43-101 report, published in March 2008, pointed out that the detailed geophysics results of 2006 allowed an upward review of the size of the ribbon-like strip

from 11.5 km<sup>2</sup> to 12.3 km<sup>2</sup>, and an upward revision of the potential diamond content to between 0.7 and 1.8 million carats.

### 3.2 Regional Topas Survey – 2007

As shown in Map 1, the Topas regional survey covered the area to the west of the basement outcrop, where the ribbon-like strip of TC formation was expected to occur. Notwithstanding the poor quality of some of the Topas records, it was possible to carry out interpretation of the records based on the current geological model. It was also possible to compare 2006 vibracores with the 2007 Topas records, as shown in Fig 2, and to map the outcrop of the Basal Miocene unit (“BM”) by analysis of reflector strength and texture. This resulted in the mapping of the TC formation, and the outcrop of the BM, along the whole length of Block J, as shown in Map 2, which also shows the extent of the LTS gravels.

The map shows that the TC formation is variable in thickness, reaching at least 5.5 metres in several places. It should be noted that when the Topas did not show a sub-bottom echo from the base of the TC formation, and no vibracores had been taken in the vicinity, the minimum thickness of the formation, to the base of acoustic penetration, was recorded. It should also be pointed out that the mapping of the TC formation was an interpretive process from geophysical records of variable quality. Caution should therefore be exercised when assessing the results.

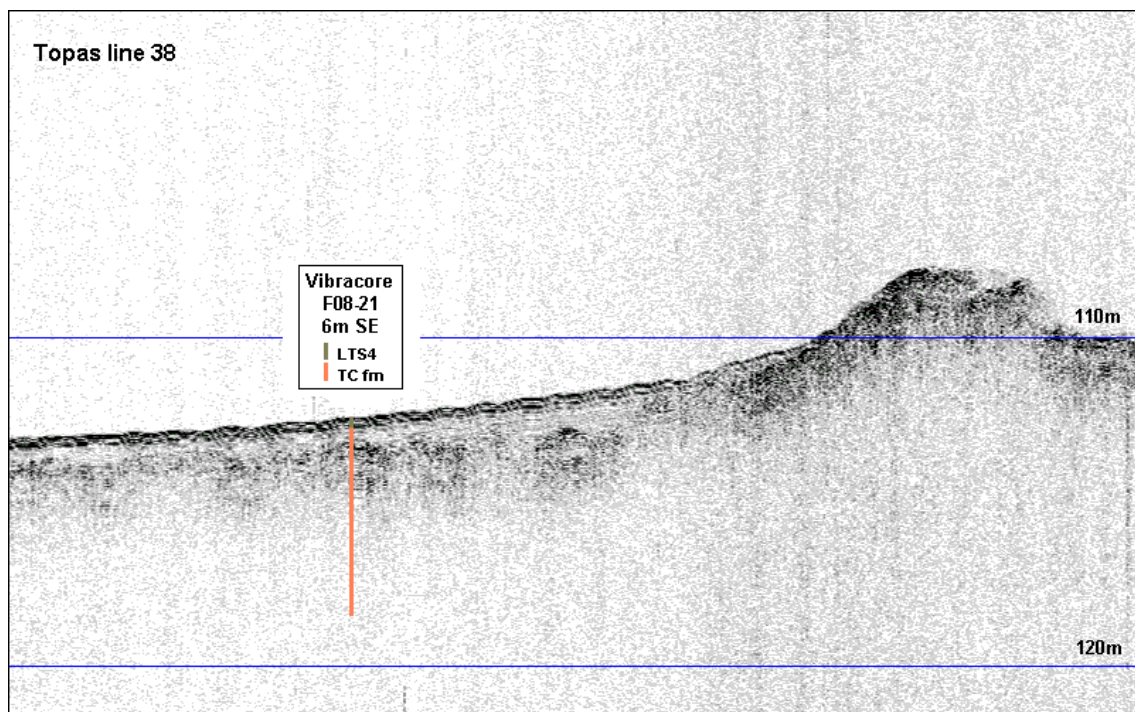
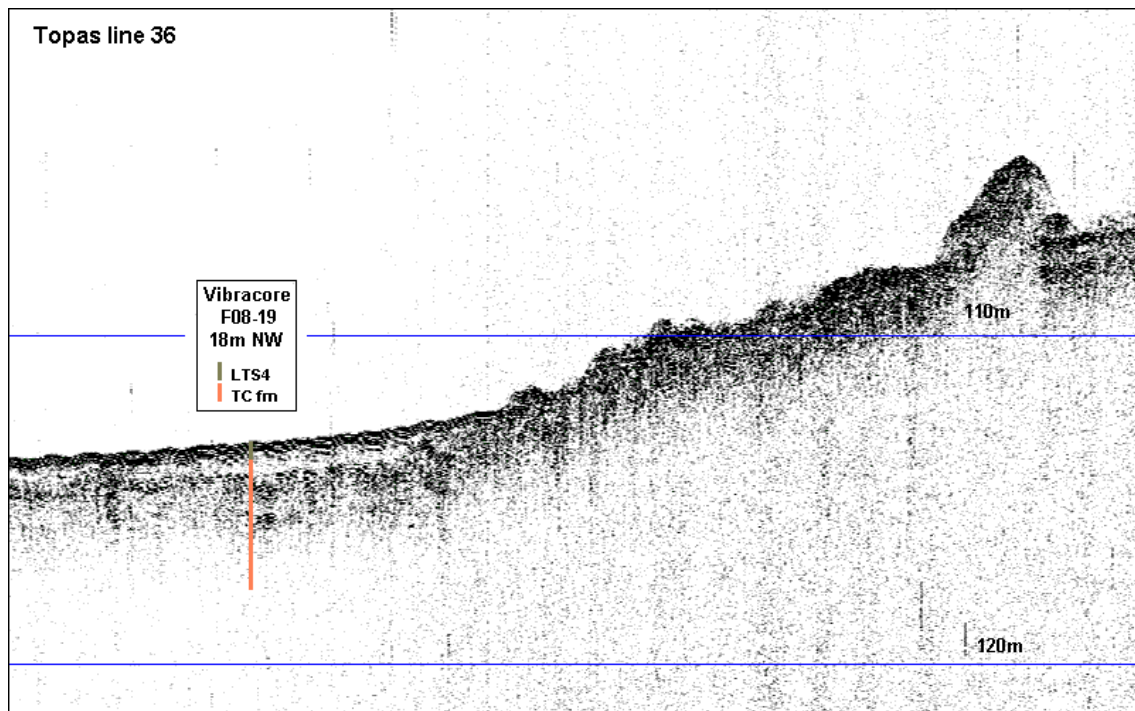
Notwithstanding the above cautions, the extent of the TC formation appears to be about 21.1 km<sup>2</sup> in extent. This figure replaces the 2008 estimate of 12.3 km<sup>2</sup>. However, it must be pointed out that there is no guarantee that the TC formation will carry diamonds along its whole length, so the 2008 estimate of potential between 0.7 and 1.8 million carats remains unchanged.

## **4. SAMPLING TARGETS**

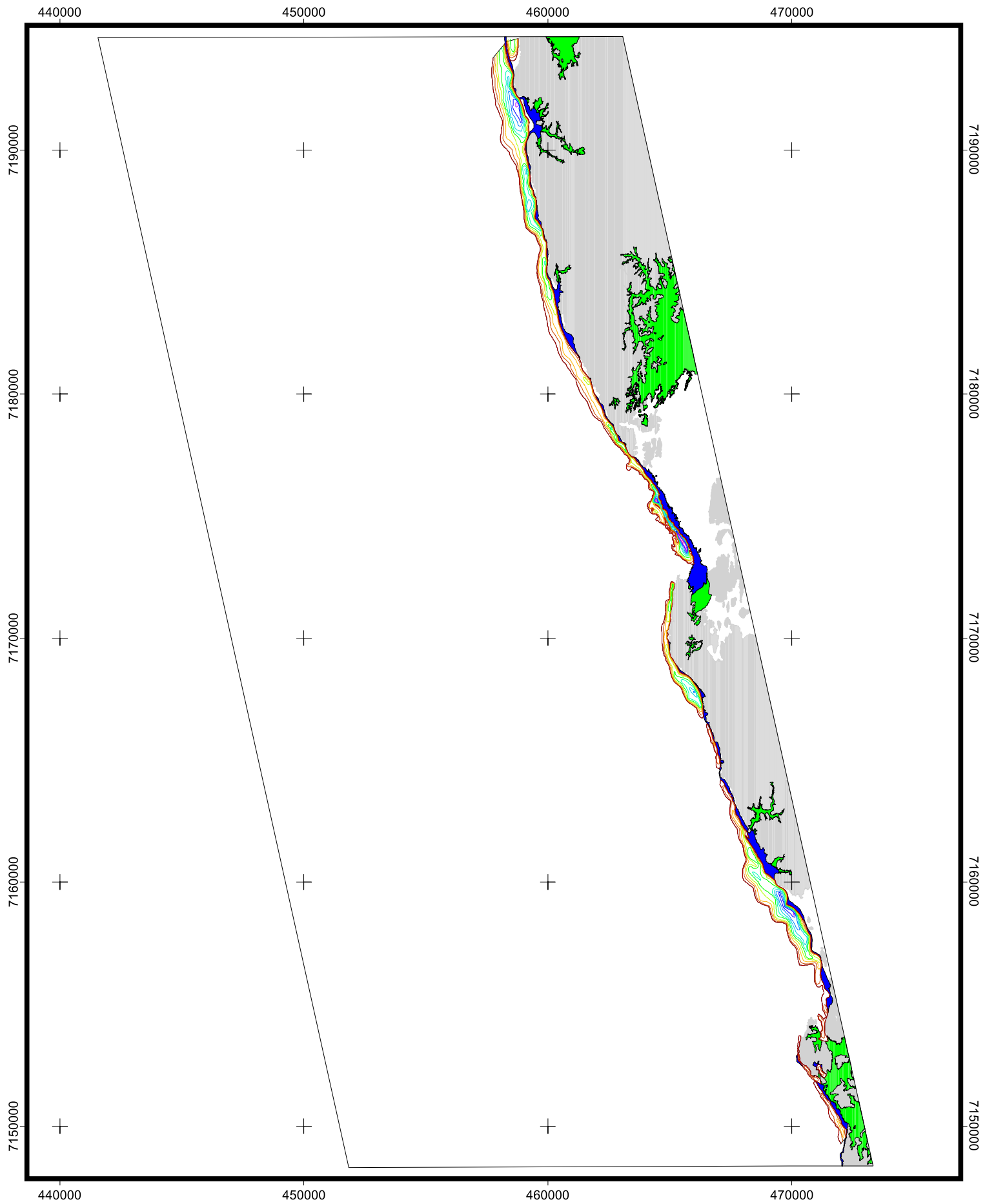
There are thus three geological formations in Block J which are known to be diamondiferous, at least in part, and are therefore potential targets for evaluation sampling.

They are:

LTS gravel	total outcrop 15.5 km <sup>2</sup>
TC formation	total outcrop 21.1 km <sup>2</sup>
Basal Miocene unit	total outcrop 5.1 km <sup>2</sup>

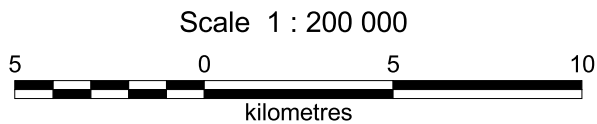


**Fig 2** – Examples of vibracore logs superimposed on Topas records. In both cases it is likely that 0.5m of the watery LTS4 material was lost from the vibracores, so the top of the TC formation is represented by the strong, irregular sub-bottom reflector. In neither example did the Topas penetrate to the base of the TC formation, probably because of its coarse nature in Feature 8. Elsewhere, the base of the (presumed) TC formation can be seen in the Topas records, as in Fig 1A. In these examples, the small scarp upslope of the TC formation is the basal Miocene conglomerate outcrop.



Map 2. Target sediments

- TC formation thickness (m)
- 0
  - 0.5
  - 1.0
  - 1.5
  - 2.0
  - 2.5
  - 3.0
  - 3.5
  - 4.0
  - 4.5
  - 5.0
  - 5.5
- Target sediments
- LTS gravel
  - TC formation
  - Basal Miocene unit
  - Basement outcrop



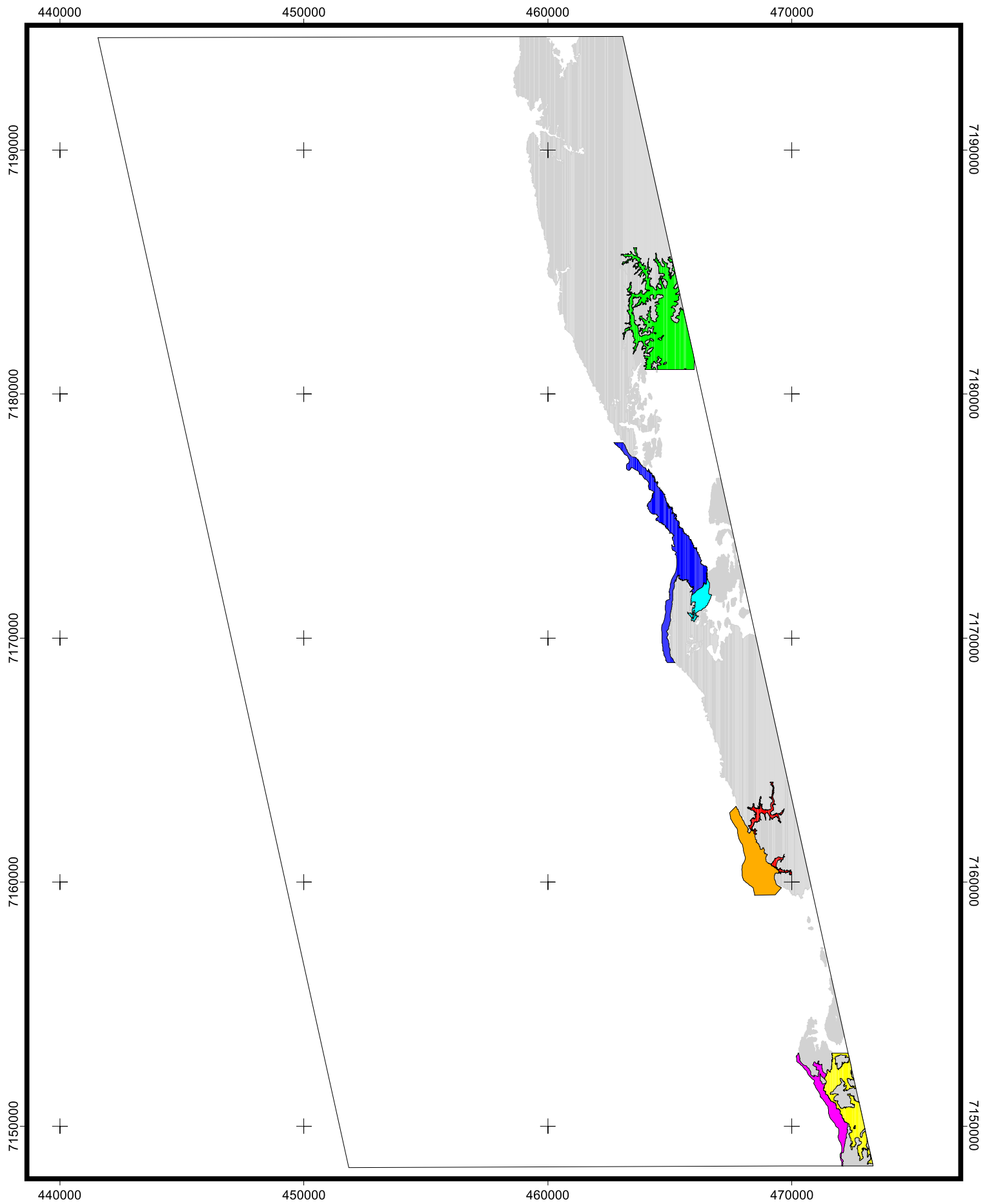
Thus the total potential target area for evaluation sampling in Block J is 41.7 km<sup>2</sup>. Because of time and budget constraints, it was decided early in 2006 to focus the detailed geophysical surveys and vibracoring on parts of Features 6, 8, 17 and 19, to prepare these for evaluation sampling. The total areas that were prepared amounted to 19.4 km<sup>2</sup>, leaving 22.4 km<sup>2</sup> for future programmes of detailed geophysics, vibracoring, and evaluation sampling. Such programmes will add definition to the local geological model and will undoubtedly change the target shapes and areas, as part of the ongoing dynamic exploration process.

In addition to the formations listed above, there are the sediments filling the large basement valley to the north-east of Feature 8 and the package of Miocene sediments to the west of the TC formation outcrop. According to the current geological model, these formations might potentially contain diamonds, but the 2001 sampling did not recover any. These formations are scheduled to be further tested on an exploration basis during the 2010 evaluation programme, but until they have been proved to contain diamonds they should not even be considered as potential evaluation sampling targets.

## **5. GEOLOGICAL ZONES**

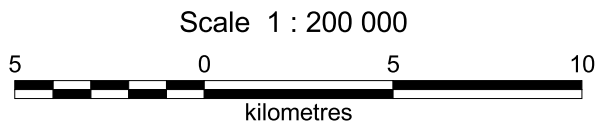
Following their appointment as independent consultants, Zstar carried out a review of the proposed evaluation sampling programme. Zstar's principal recommendation was that the deposits should be grouped into clearly defined geologically homogenous zones, and estimation of the resource would be carried out separately for each zone. In this manner the geostatistical parameters of each zone would be more clearly defined so that confidence in the total resource estimate will be increased.

As a result of these recommendations, Afri-Can decided to group the BM unit and the TC formation into one zone (the "BM-TC zone") as it will not be practically possible to identify these formations during sampling operations and to split the samples, especially where the TC formation lies directly on the BM unit. It was also decided, on Zstar's recommendation, to extend the BM-TC and LTS gravel zones in the eastern part of Feature 8 slightly beyond the extent of the 2006 detailed geophysical surveys, in order to provide geological, rather than artificial boundaries. In an adjacent area, the geological zone was extended to bridge an apparent gap in the outcrop of the TC formation. The geological zones are shown in Map 3.



Map 3. Geological zones

- Geological zones
- F06 LTS-gravel
  - F08 BM-TC
  - F08 LTS-gravel
  - F17 BM-TC
  - F17 LTS-gravel
  - F19 BM-TC
  - F19 LTS-gravel



## 6. SUMMARY OF TARGETS AS AT JANUARY 2010

Target Sediment areas (km<sup>2</sup>)

	<b>F6</b>	<b>F8</b>	<b>F17</b>	<b>F19</b>	<b>OTHER</b>	<b>TOTAL</b>
LTS gravel	6.6	0.9	2.6	0.6	4.9	15.5
TC formation	0	2.8	0.9	2.2	15.2	21.1
BM unit	0	1.6	0.4	0.8	2.3	5.1
All	6.6	5.3	3.9	3.6	22.4	41.7

Geological Zone areas (km<sup>2</sup>)

	<b>F6</b>	<b>F8</b>	<b>F17</b>	<b>F19</b>	<b>OTHER</b>	<b>TOTAL</b>
LTS gravel zone	6.5	0.7	2.5	0.6	0	10.3
BM-TC zone	0	4.9	1.4	3.0	0	9.3
All	6.5	5.6	3.9	3.6	0	19.6



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29<sup>th</sup> January 2010