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**ANNUAL REPORT FOR THE PERIOD 13/08/2011**  
**TO 13/08/2012**

**MONARCH FLATS EXPLORATION LICENCE**

***EL 09/2011***

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## **ABSTRACT**

EL 9/2011 Monarch Flats was granted on 13th August 2011. The area was claimed to consolidate the known tin resources, explore for the obvious potential for open pit disseminated tin, gold (and monazite) deposits, and to rationalize the deposit groups that are within influence of the Northern Blue Tier Batholith.

Work during the annual period comprised research of the voluminous historical data (over 77 gigabytes in size) and gathering an understanding of the tin deposits around the Mt Cameron Batholith and related, but incompletely mapped, granitic stocks to the south (Pioneer, Sth Cameron)-ongoing.

Interpretation of Processed Landsat Imagery and fact geology with emphasis on the brittle structures that focused the ancestral drainages, and features peculiar to high level granites, major domes-cupolas, and batholiths or stock perimeters-ongoing.

Interpretation of Processed radiometric and magnetic imagery, 1950s black and white aerial photographs, and interrogation of Google Earth Imagery was undertaken to;

- find evidence of historical workings, sluicings etc
  - particularly areas of natural rehabilitation and abandoned dredging or sluicing areas.
  - Examine the geomorphology in resource area for evidence of undocumented mining, drilling, and assess.
  - Examine the Scotia area for evidence of source areas and the oldest evidence of mining.
- crosscheck the important structural features against the in mine faulting
- position the unmined Clarence –Hasties-Bonser Creek tin systems from 1930s maps onto current landforms. and

- trace the possible radiometric anomalies in relation to resources at Monarch and Endurance and the large sheet wash from Mt Cameron.

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**Keywords:** Stanniferous Depocentres, Pioneer, Endurance, Scotia, Clarence, Monarch ,mega-sutures, paleodrainages , granite distribution.

## **FIGURES**

## **1.INTRODUCTION**

**Exploration Rational** – see abstract

**Licence**

**Tenement Number EL09/2011**

**Beneficial Holder**

The Tenement was applied for by Tin Dragon Pty Ltd of 214 York Street, Subiaco ,WA 6008.

**Area**

The project area is currently encompassed by a 103 sq. km Exploration Licence, EL 09 / 2011. Specifically:

**Date of Grant** \_13 / 08 / 2011

Expenditure Commitment : First two years \$70,000.

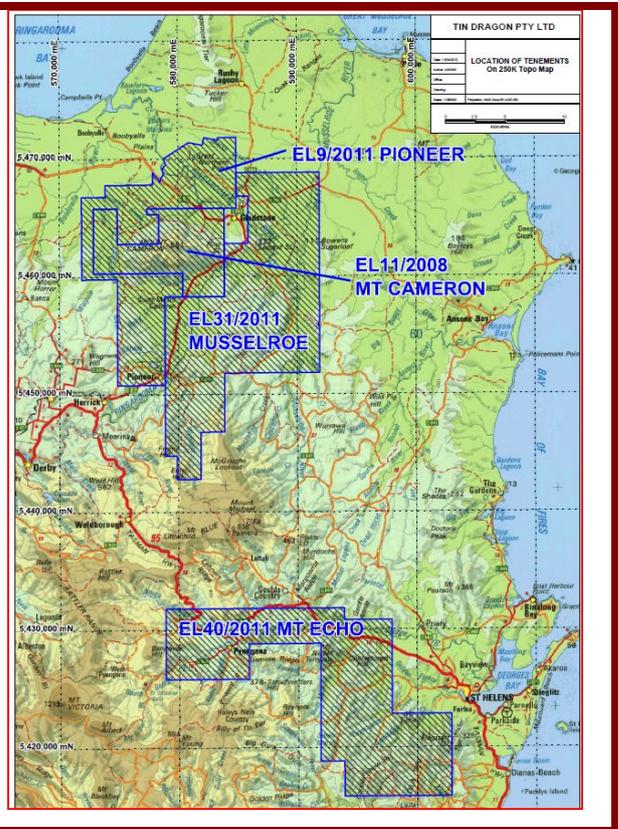
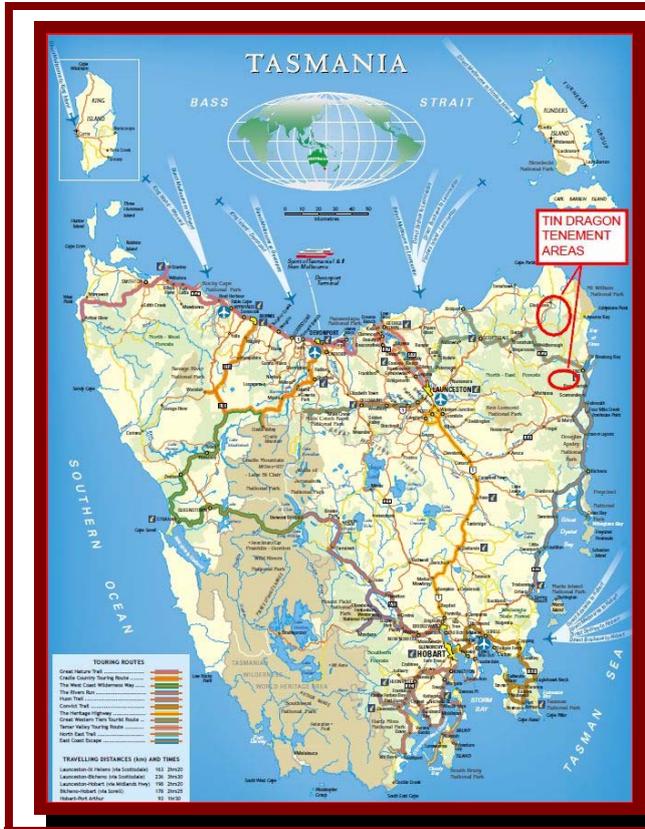
Reporting Period is 13<sup>th</sup> August 2011 to 13<sup>th</sup> August 2012.

**Tenement Location**

The Pioneer (or Monarch Flats ) Project is located in north east Tasmania approximately 85 kilometers north east of the City of Launceston .The Pioneer project is located just west of the Pioneer to Gladstone Road. The other key prospect areas are distributed around the southern, northern and western flanks of the Mt. Cameron massif – part of a juxtaposed group of three Exploration Licences being explored by Tin Dragon Pty.Ltd (*figure below*).

Access to the perimeter of the project area is excellent. An all weather sealed road services the townships of Gladstone and Pioneer and a well formed gravel track provides heavy vehicle access from that public road to the project sites.

Land tenure is a mixture of government forest and low-conservation-value reserves, plus private freehold/leasehold land. In the tenements no parts of the known tin resources are barred to access.



## **2.REVIEW OF PREVIOUS WORK**

### **Prior to Current Tenement**

### **During Current Tenure**

See Sections 3 and 4.

### **3.REGIONAL GEOLOGY AND MINERALISATION**

#### **HISTORY OF MINING**

The first documented discovery of tin in north eastern Tasmania was by George Renison Bell at several locations in the Boobyalla River catchment in 1874. Prospecting in the ensuing two years to 1876, explored all the region's waterways and identified the bulk of the region's major alluvial tin deposits, including the Krushka Brothers strike at the Briseis mine (Derby) and William Bradshaw's discovery of the Pioneer tin deposit. These mines and their surrounding mineral fields developed rapidly and private settlements were gazetted as townships by the Crown. A port and town was established at Boobyalla, north of the tenements, but these are now abandoned.

Most production occurred before 1900 but continued at a reduced level until 1982 when the remaining large mines such as the Pioneer and South Mount Cameron mines closed.

The tin, which occurs as cassiterite in basal gravel in placers in the Tertiary/Quaternary Recent sediments stretching from near Branxholm to Ringarooma Bay, was derived from erosion of the tin-rich granites. The main mines were the Briseis, Pioneer, Endurance, Valley and Arba. Mining also occurred in the Tertiary sediments west of St Helens. Recorded production until the early 1960s was about 41 660 tonnes of metallic tin [64-381]. Most of the mining was by hydraulic sluicing but some dredges were used including the Dorset dredge which operated from 1944 to 1971.

Very little mining, or exploration for, the primary tin sources of these extensive deposits has been done.

#### **PAST PRODUCTION**

The largest producing deposit in the NE of Tasmania was the BRISEIS, located south of the Tenement at Derby, which produced from the Cascade Lead 18,600t cassiterite concentrate in the period 1876-1960.

The next largest were the Pioneer and Endurance, both of which are within EL09/2011.

Production figures from mines in the Tin Dragon group of tenements is often sketchy because especially before 1900 they were poorly recorded or incompletely compiled. Care must be taken when compiling because often cassiterite concentrate is confused with tin metal. No tin metal was produced from the tenement areas; all was cassiterite dispatched to smelters elsewhere.

The **staged mining development and broad exploration history of the Tin Dragon tenure areas** is outlined as follows;

**1870-1930** Discovery of Wyniford (1873), Endurance (1875), Pioneer (1877), Wyniford (1870s), Monarch (1880), Scotia-Lochaber (1881-the shallowest of the deep lead deposits), Scotia-James Galloway (1901), Great Northern Plains (1870), Arba, and Briseis;

From 1888 to 1893 the Garibaldi Tin Mining Company and the South Garibaldi Tin Mining Company NL operated at Wyniford.

By the year 1900 the Pioneer Tin Company (PTMC) and Endurance Tin Syndicate had commenced operations with yearly tin production of 50 to 350 tonnes over a 30 year period,

By 1901 the Great Musselroe Proprietary Company had completed mining shallow ground and Eastern Terrace. A number of smaller operators worked the area until 1959

The Tasmanian Mines Department were drilling at Scotia in 1902 to 1944 (the number of holes drilled in the project area by all operators up until 2008 totals 1,389).

Mining was primarily by sluicing, and hand streaming,- the deposits being relatively shallow and surficial. Smaller operations were generally abandoned by the early 1900s.

- the Gladstone Tin Development Company , the Ringarooma Bucket Dredging Company and Dorset Bucket Dredging Company (later known as the South Mount Cameron Tin Dredging Company ) were operating as early as 1905-1910 .

The Imperial Tin mining Company (ITMC) produced at the Scotia –Lochaber deposit from the early 1880s to 1925.

The Briseis Tin and General Mining Company produced around 500 tonnes of cassiterite for each of its 30yrs of operation

1900-1920 the Arba Tin Mining Company NL were in full production at 50-120 tonnes per annum.

1928-approx 1935 The Rajah Tin Mining Company operated at Wyniford.

### **1933 to 1970**

By the time the PTMC was closing its operations (over \$500,000 in dividends to shareholders ), having produced over 9,100tonnes of cassiterite, the **Endurance Tin Mining Company (ETMC)** had purchased the Pioneer and significant infrastructure assets and settling in for a sustained tin production at Endurance - period from **1933 to 1970**.

In the 1930's-1945 tin shortages during the second world War.

1935 to 1955 The Mines Department were again actively drilling and assessing the Scotia area .

1930 -1952 the New Briseis Tin Mines Ltd, Briseis Consolidated NL, and finally Briseis Tin NL produced from 50 to 650 tonnes of cassiterite **per annum** up until around 1952.

1940-1950s (into the 1960s) Messrs Groves and Richardson, Wood and Bartels, Dun and Park, the Lanka Tin Mining Company. Drilling was undertaken by ETMC, Storeys Creek, Lanka, Star Hill Syndicate

1950-1960s Explorers: a number of companies were drilling (often utilising hand augers) in the known tin areas (example; working in the Musselroe and Musselroe Swamps areas were Austral Malay Tin Limited, Delta Tin; Dorset Tin Dredging, Rio Tinto, Utah Development). BHP, Storeys Creek Tin Mining , and the Tasmanian Mines Department were active in the area.

1950-1970s-In the same general district dredging operations commenced and were sustained for a period of 25yrs (e.g. Dorset and new Dorset)

In 1960 Storeys Creek Tin Mining Company purchased the Dorset Dredge from the Commonwealth Government.

1968-1974 the Texins Development Pty limited company operated in the Wyniford River area.

Private operators such as Mr. Vern Woods were producing tin concentrate to around 200-250 tonnes from Pioneer, Monarch etc

### **1970s-1980s**

Interest in the Australian tinfields was strong in this period. A new breed of companies began mining and exploring in the early 1970s;

Portland Holdings, Hellyer Mining, Wanex Mining Pty Ltd, Preussag Australia, Australian Anglo American Limited were exploring in the district, sometimes in complex 4-way Joint Ventures.

Companies particularly active in the Tin Dragon resource areas included Blue Metal Industries (1970s, Musselroe Swamps, Scotia), and the AMDEX Mining Consortium (around 1975-1982).

Both companies explored heavily in an effort to ramp up their mines (Pioneer, Endurance, Monarch, and Scotia). BMI purchased the assets of ETMC, leading up to its delisting in 1973, after some 93 years of tin mining in NE Tasmania-primarily in the Tin Dragon controlled areas.

Early 1980 to 2000 Little exploration or company scaled mining conducted due primarily to the collapse of the International Tin Council.

**Late 1990s-2012** Mineral Holdings (MHAPL) procured many of the assets owned by former companies. They advanced the inherited technical databases before on-selling to Van Diemen Mines (VDM)-a publically listed plc company(2003-2008).

In the period 2007-2009 Van Diemen commenced mine development at Scotia while Kangaroo Metals were farming into the Sth Cameron-Riverside operation.

**2011-2012 Tin Dragon Pty Ltd** has compiled the following production figures from within its tenements:

**PAST PRODUCTION - >23,000t cassiterite, including these main deposits:**

- **Pioneer - 10,814t**
- **Endurance- 6,240t**
- **Dorset Dredge - 2,714t**
- **Scotia - 1,270t**
- **Monarch-**

The estimated Total Resources in the Tin Dragon Tenements (all categories except Possible or Potential) **approximates 16,446 tonnes of cassiterite concentrate-see table below.**

<b>MAIN KNOWN PLACER RESOURCES HELD BY TIN DRAGON</b>					
<b>DEPOSIT</b>	<b>Volume bcm</b>	<b>Grade gm/cu. m</b>	<b>Tonnes Cassiterite</b>	<b>Strip Ratio</b>	<b>Category</b>
<b>Monarch</b>	1,861,100	346	643		Indicated
<b>Endurance</b>	3,820,000	959	3,707	4	Proven/Probable/Inferred
<b>Clarence</b>	2,052,000	290	587		
<b>Pioneer</b>	18,620,000	290.3	5,269	4.9	Measured/Inferred
<b>Scotia</b>	3,657,000	1,300	4,220	4.7	Probable
<b>Ringarooma Flats</b>	13,210,000	442	980		
<b>Musselroe Swamps-North</b>	3,711,500	146	487		
<b>Wyniford</b>	850,000	650	553		Indicated
<b>TOTAL</b>			<b>16,446</b>		

The deposits with the largest resource base are Pioneer, Scotia, and Endurance. At both Pioneer and Endurance the mining has been idle for the last 28yrs. The resources have remained intact for that time and were refined utilizing the databases generated by the previous explorers and more recently by Van Diemen Mines in the period 2003 to 2008.

In the case of deposits Monarch, Endurance, Pioneer, Scotia, the potential for expansion of the resources is considered excellent and the tenement holder continues to research the extensive historical database for production centers, further potential, and for practical controls on the known tin areas.

In addition there is a practical synergy between the former three deposit areas and the un-exploited Clarence, Hasties, Eastern Leads and South Cameron prospect areas.

**TOTAL "ENDOWMENT"** – the combination of all known production plus proven and drill indicated resources (endowment) is >40,000t (Current, including only the known deposits). Examination of the architecture of deposit controls, basin geometry, and granite distribution clearly demonstrates, in the view of Tin Dragon, that the endowment polygons are confined (more or less) to the "day lighting" positions of the alluvial tin – with little apparent consistent effort to explore in areas of shallow overburden.

## GEOLOGY

The northern Gladstone areas, within EL 9/2011, are characterized by relatively poor outcrop and much of the basement rocks are covered with various types of unconsolidated sediments, most of which are tin bearing. Consequently prospectors and companies;

- have been able to exploit the subcropping alluvial deposits over a sustained period between 1880 to 1982, but
- have been unable to locate the source areas of primary tin deposits in the project area.

All known metallic resources in the Monarch Flats tenement are alluvial tin (with accessory gold, illmenite, monazite, sapphires?).

The original sources of the cassiterite were the Devonian tin-bearing granites of the Blue Tier Batholith. Tin concentrates in quartz and greisen vein systems in the roof zone of the granites near the contact with overlying Silurian Mathinna Beds.

The relevant history of the region commenced in Permo-Triassic time (ca 250Ma) with the unroofing and erosion of the granitic rocks. In late Jurassic time (ca 150Ma) further uplift occurred with intrusion of extensive igneous dolerite sheets followed by a long period in the Late Cretaceous (ca 75Ma) of widespread and intense erosion. Deep weathering of the granites during this period resulted in liberation of large amounts of cassiterite from the granitic hosts and their deposition in alluvium of the streams draining the highlands.

During Middle Eocene time (ca 46Ma) volcanic activity commenced along the Blue Tier and into the Boobyalla area with the extrusion of the Older Basaltic lava flows. It is likely that these were emplaced along stream valleys incised into the pre-Eocene granitic land surface, and so buried the older alluvial cassiterite deposits.

From the Mid Eocene to Late Oligocene (ca 46 to 24Ma) uplift and a humid tropical climate resulted in rapid erosion of the basalts, and renewed liberation of cassiterite from granites and reworking and upgrading of the earlier pre Middle Eocene alluvial deposits. The Middle Miocene (ca 14Ma) saw a second period of basaltic volcanism with extensive lava flows down many of the larger valleys in the Derby area, causing diversion of the Ancestral Ringarooma River.

Post Middle Miocene to Recent alluvial deposits were then formed along the alluvial flats of the Ringarooma River and other rivers.

In the far north there were marine incursions which have reworked the earlier alluvials.

In summary there has been a complex history of placer formation which has allowed for unique opportunity for reworking and concentration of cassiterite.

Reconstructing the complex alluvial history of the area is important for generating new prospective areas. Tin Dragon is fortunate to be able to build upon the 140 years of mining and exploration experience and a vast database to assist in this process.

#### **4.EXPLORATION COMPLETED DURING CURRENT REPORTING PERIOD**

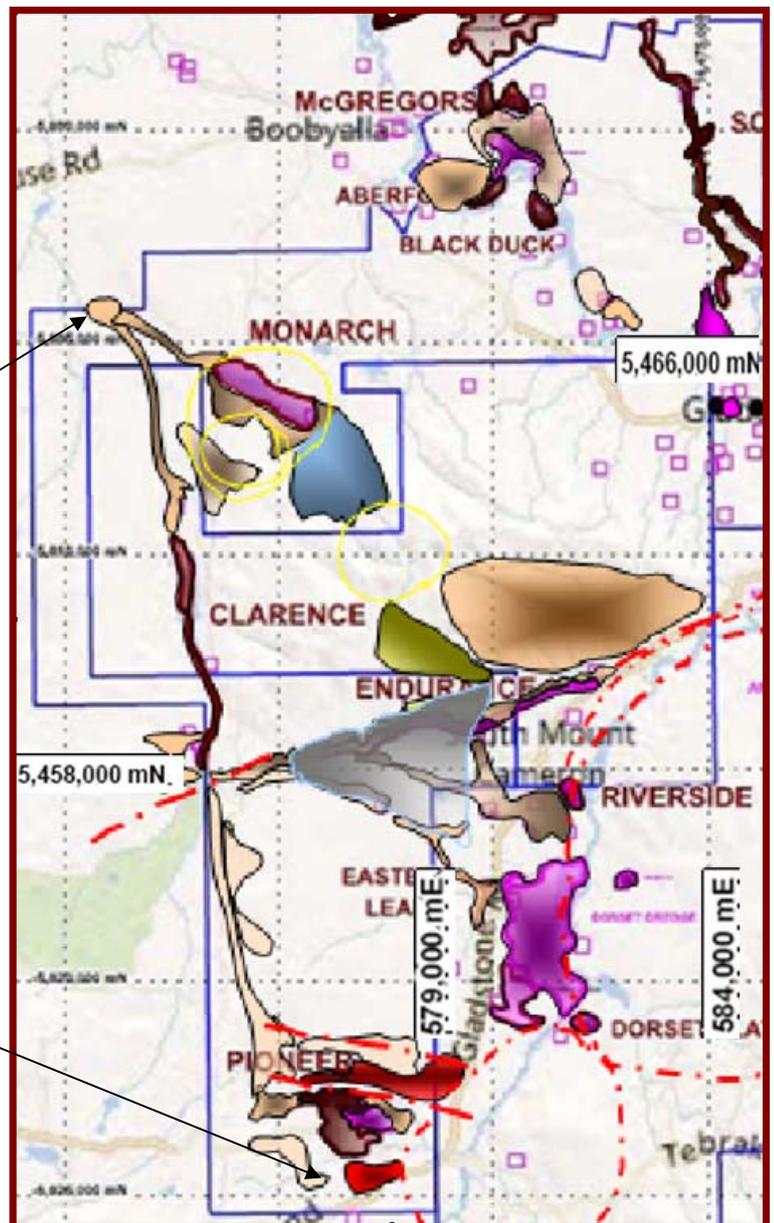
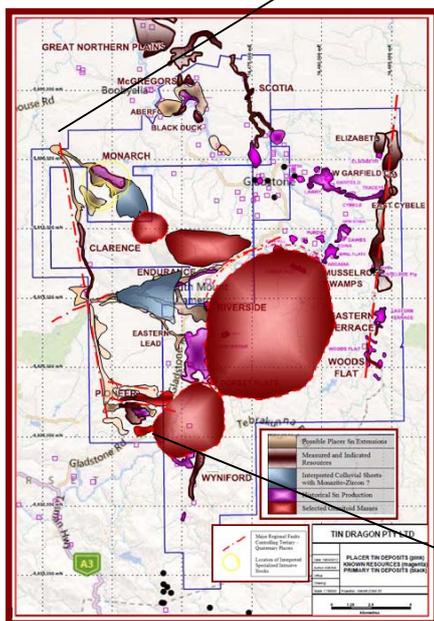
1. Recovery and formatting historical and GIS data.
2. Data compilation from MRT open files and other databases.
  - research of the history of tin production areas
  - instigation of detailed studies in the Endurance, Endurance West, Clifton, Eastern Endurance, South Cameron, Bonser Creek projects and the radiometric sheet wash areas.
3. Review of environmental, cultural, and heritage data pertaining to individual project areas ,were available (e.g. Endurance and Scotia).
4. Geological appraisal of the regional context of EL09/2011
  - establishment of the historical tin production, current tin resources, potential and total endowment in the context of the Blue Tier Batholith.
  - interpretation of the geological architecture of the basinal depocentres and significant structural corridors controlling the tin distribution.

#### **5.DISCUSSION OF RESULTS**

Initial observations from investigations include (*see figure below for reference to polygon designation*);

- At least 5 Tertiary paleochannel placer tin deposits- *purple on figure below-* (and 4-5 additional poorly explored paleochannels-*pale orange polygons* ) – most of which contain measured resources – are interpreted for the Monarch Flats Exploration Licence.
- A significant area of 3-4 very large (approx 8km long), multiply reworked, drainage channels –representing regional scaled fault zones (Endurance , Clarence and Shallamar) – *red dashed lines below*-and
  - Onshore ,poorly explored alluvial fans/depocentres ( 20 to 50square km)

- all resources (*maroon colored polygons*) previously held and drilled by well known , long life (30 to 90yr ), public corporations such as Pioneer Tin Mining Company, Endurance Tin Mining Company, Clifton Syndicate , never before held by one entity, and more recently;
  - Van Dieman Mines Pty Ltd. and Kangaroo Metals (casualties of the GFC).
- These resources are demonstrably prospective for many more alluvial resources and for basement tin/tungsten mineralization.
  - adjacent to sub members of the Northern Blue Tier Batholith (notorious for governing a total regional endowment in excess of 100,000tonnes of cassiterite) –*red and yellow colored circular and curvilinear features and orange /green sub variants of Mt Cameron?* –below and
  - accessory monazite (Monarch, Endurance),and gold (Pioneer etc) may be important in the area but reports to quantify this is are sparse.-*pale blue areas .*



## **6.CONCLUSIONS**

### **Recommendations and Proposed Future Exploration**

Detailed research and interpretation is underway for the Endurance Group ,Pioneer ,Football Oval, Dorset West ,Pioneer North, Clarence, Clarence Extended, Monarch West Fan, Monarch NW,Scotia, Bonzer Creek, Hasties, West Sth Cameron, Eastern Leads project areas .

## **7.ENVIRONMENT**

**Surface Disturbing Operations;** No surface disturbing operations conducted during the period.

### **Surveys**

**Rehabilitation;** Not Applicable during the reporting period

## **8.EXPENDITURE**

Expenditure on exploration for the period 13<sup>th</sup> August 2011 to 13<sup>th</sup> August 2012;

<b>EXPENDITURE EL9-2011</b>		
<b>Monarch Flats</b>		
<b>Grant</b>		
	<b>13/8/2011</b>	<b>Expenditure/Quarter</b>
<b>YR</b>		
<b>2011</b>	Q3/11	<b>24749</b>
	Q4/11	<b>0</b>
<b>YR</b>		
<b>2012</b>	Q1/12	<b>7200</b>
	Q2/12	<b>38100</b>
	<b>TOTAL</b>	<b>70,049</b>

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