Horizons Regional Council LUC GIS database and mapping

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Summary

Project and Client
This project, LUC GIS mapping – Horizons (802-HZLC71), for the Horizons Regional Council built on previous work, Correlation of Land Use Capability (LUC) units (617-HZLC63) that was carried out between October 2008 and late December 2008 (Harmsworth & Page 2009). The previous project correlated almost 300 New Zealand Land Resource Inventory (NZLRI) Land Use Capability (LUC) units from 6 different NZLRI regions for the Horizons Regional Council area and tabulated them into 1 comprehensive Horizons regional classification document with tables. This new 2009 LUC GIS database/mapping project has used the LUC and resource data from the previous report to produce a regional GIS shapefile for the Horizons regional council administrative area.

Objective
The primary objective was to produce a regional LUC GIS database (shapefile) for the Horizons regional council area, single LUC numbering, and to provide accompanying documentation including a summary report and key maps.

Methods
Methods were largely office- and computer-based, focussed on data entry and then generating and checking all correlated LUC units and NZLRI inventory data, for 6 NZLRI regions: Taranaki–Manawatu (10), Wellington (09), Southern Hawke's Bay–Wairarapa (08), Northern Hawke's Bay (07), and Bay of Plenty (04), and Waikato (02). All data from the previous regional LUC correlation report were first entered into a excel spreadsheet, and then converted into a GIS shapefile where they were checked, validated, corrected, and specific changes were made. The project defined, re-organised and categorised LUC units for the region into LUC suites and sub-suites, given as tables and identified as a specific LUC suite and LUC subsuite field in the shapefile.

Results
A regional LUC GIS database (shapefile) was produced for the Horizons Regional Council administrative area. Accompanying documentation includes a report, summary tables, and key maps. The final product gives a unique single Horizons LUC numbering system, and has defined and in some cases re-organised LUC units for the region into LUC suites and sub-suites, and generated a set of key maps from the revised data. The completed single HRC regional LUC database comprises over 1626 unique LUC attribute combinations, 36 different fields of data for each LUC combination, and approximately 288 unique LUC units from 6 separate NZLRI regions. These LUC units were grouped into 16 LUC suites and 30 LUC sub-suites for the Horizons region. The regional LUC GIS database (shapefile) can be used to generate a large range of data, maps and statistics for research, policy and planning.

Conclusions
The lack of a comprehensive single regional Land Use Capability (LUC) correlation across the Horizons Regional Council area has historically been an obstacle for linking, interpreting, and mapping LUC units from one side of the Horizons region to the other. This new regional LUC GIS database will allow detailed regional-local analyses to better inform research, planning and policy. Based on improved definition of LUC and inventory data, it will underpin a range of operational activities for the council and enable improved regional and catchment mapping, physical resource and LUC assessment, analyses, and modeling to help achieve agreed outcomes for future sustainable land management planning and policy. The regional LUC GIS database is more consistent, standardised, and better aligns with LUC classification criteria specified in the 2009 3rd edition NZ LUC survey handbook (Lynn et al. 2009).

1. Introduction

Introduction
The Horizons Regional Council (HRC) region is large, and covers 22 219 km^2 or ~8.3% of New Zealand's land area (Fig. 1). It includes a number of districts – in the north-west, part Stratford, Ruapehu, part Waitomo; in the west, Whanganui; central areas of Rangitikei, Manawatu, Palmerston North city, and Horowhenua; in the far north, part Taupo; and in the east, Tararua District.

There are 6 whole or part New Zealand Land Resource Inventory – NZLRI (NWASCO 1975–79; NWASCA 1986) regions recognised within the HRC region (Figure 2), namely: Taranaki–Manawatu (10), Wellington (09), Southern Hawke's Bay–Wairarapa (08), Northern Hawke's Bay (07), and Bay of Plenty (04) and Waikato (02). The NZLRI regional areas were surveyed and classified using a standard LUC mapping approach (SCRCC 1971) with most NZLRI mapping carried out between 1975 and 1979, and more recent remapping and classification of the Wellington region between 1987 and 1990 (2^{nd} edition NZLRI, Page 1995). The LUC units for each NZLRI region are unique and sequentially numbered. The respective LUC extended legends for each region (NWASCO 1975–79; NWASCA 1986) accompany hard copy maps and the national NZLRI database. For each region groupings of 'similar-related' LUC units or 'families' called LUC suites/sub-suites are described in accompanying bulletins (e.g., (NZLRI region 04) Blaschke 1985; (NZLRI region 08) Noble 1985; (NZLRI region 10) Fletcher 1987; (NZLRI regions 07, 09) Page 1988, 1995). No bulletin exists for the Waikato region (region 02). A general national correlation of LUC was carried out in the 1980s (Page 1985) but is not regarded as of sufficient enough detail for district/regional interpretation, mapping, and analyses.

For the HRC region a regional LUC unit correlation was therefore necessary to address inconsistencies, anomalies and the lack of alignment in the LUC unit data.

This FRST medium-advice Envirolink project, LUC GIS mapping-Horizons (802-HZLC71), was carried out between 30 July and 24 December 2009 to establish a regional GIS LUC database for the Horizons Regional Council area. It builds on the previous work, Correlation of Land Use Capability (LUC) units (617-HZLC63), which was carried out between October 2008 and late December 2008 (Harmsworth & Page 2009). The previous 2008 LUC project correlated almost 300 NZLRI LUC units from the 6 different NZLRI regions in the HRC area to form a single LUC classification. The 2009 LUC GIS database/mapping project has checked, validated and corrected all LUC units and resource data from the previous regional LUC correlation, and then established a regional LUC GIS database (shapefile), a single Horizons LUC numbering system, defined and in some cases re-organised LUC suites and sub-suites, and generated key maps from the revised data. It also sought to bring the regional correlation in line with new LUC standards documented in the updated 2009 LUC handbook (Lynn et al. 2009).

Objective
The primary objective was to produce a regional LUC GIS database (shapefile) for the HRC area, a single LUC numbering, and to provide accompanying documentation including a summary report and key maps. The LUC and resource data were produced as tables and maps, and all LUC units categorised and grouped into LUC suites and LUC sub-suites (Table 5).

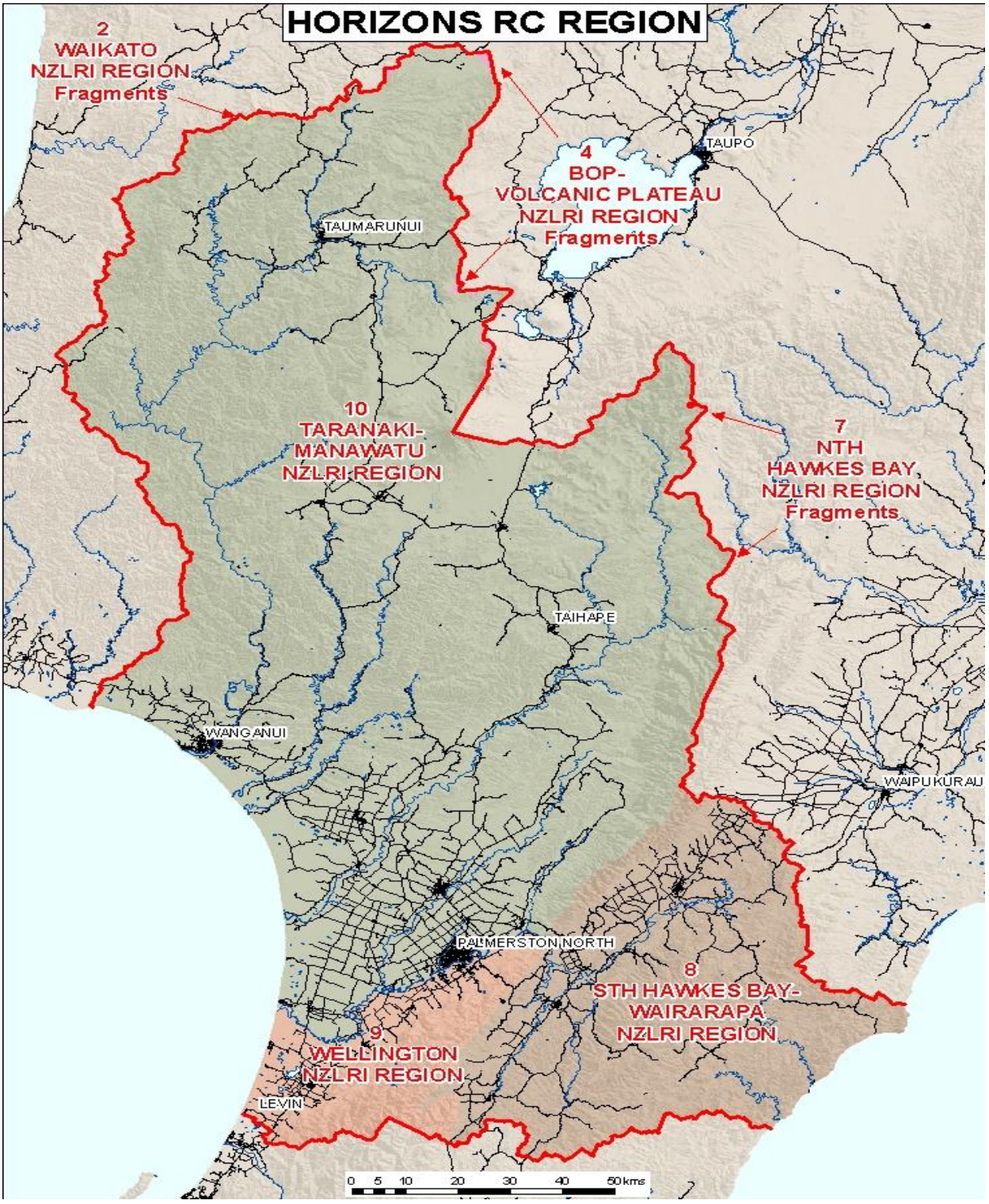

Figure. 1 The Horizons (Manawatu–Whanganui) region, showing the regional extent and existing NZLRI map region names and numbers used in this regional LUC correlation

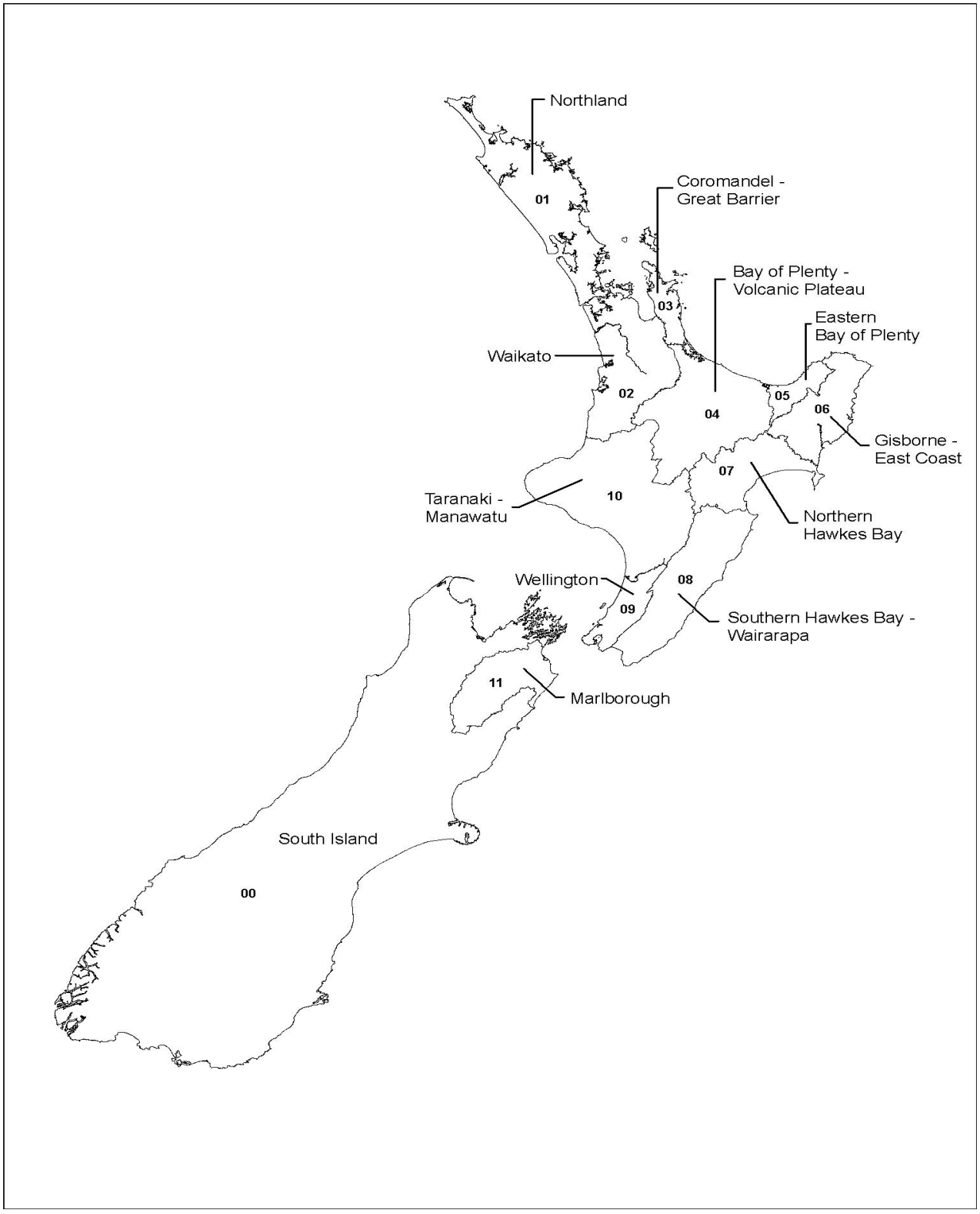

Figure. 2 New Zealand Land Resource Inventory survey regions (showing 'legend' numbers and region name)

2. Methods

Methods were largely office- and computer-based, focussed on data entry and then generating and checking all correlated LUC units, and NZLRI inventory data, for the 6 NZLRI regions: Taranaki–Manawatu (10), Wellington (09), Southern Hawke's Bay–Wairarapa (08), Northern Hawke's Bay (07), and Bay of Plenty (04), and Waikato (02).

All tabulated data from the previous regional LUC correlation report (Harmsworth & Page 2009) were first entered into a excel spreadsheet, and then converted into a GIS shapefile where they were then checked, validated, and corrected, and specific changes were made. Maps were generated to help during the checking and validation. The final product gives a single unique Horizons LUC numbering system, and has defined, added, and in some cases re-organised LUC units into LUC suites and sub-suites, and then generated a set of key set of maps from the revised data. The resulting shapefile can be run on ArcInfo and ArcView software.

3. Results

A regional LUC GIS database (shapefile) for the HRC administration area was produced. The completed HRC regional LUC database comprises over 1626 unique LUC unit combinations, 36 different fields of attribute data for each LUC combination, and 288 unique LUC units from 6 separate NZLRI regions. A new unique single Horizons LUC numbering system (HRC numbers) resulted from the regional LUC correlation. LUC units from the GIS shapefile were grouped into 16 LUC suites and 30 LUC sub-suites for the Horizons region (section 4, Table 5). The regional single LUC GIS database can be used to generate a large range of maps for research, policy and planning. All LUC Class areas have been recalculated (Table 1).

The existing NZLRI extended legend most commonly used for the Horizons region is Fletcher 1987 because it covers a large part (~75%) of the Horizons region. This LUC legend was used as the base legend for the new regional LUC database and tables. The integrity of the original NZLRI LUC units has been maintained in the new GIS shapefile and is identified as a unique NZLRI LUC field by NZLRI region in the spreadsheet.

Table 1 LUC Class areas for Horizons Regional Council area (Nov 2009: Landcare Research NZ Ltd)

Land Use Capability Class (LUC)	Area (ha)	% Area of Horizons region
1	33 921.7	1.5
2	116 113.5	5.2
3	240 624.6	10.8
4	159 585.3	7.2
5	3898.4	0.2
6	821 638.3	37.0
7	608 569.6	27.2
8	219 391.4	9.9
Towns, rivers, lakes	15 995.8	0.7
TOTAL	**2 219 738.6**	**100**

Some of the significant changes made in this new Horizons regional GIS database are:

- Correlation of all LUC units and new LUC Class, LUC subclass and LUC unit areas;
- All correlated NZLRI data incorporated into a GIS shapefile;
- Single LUC classification numbering for the Horizons region in the shapefile;
- Changes to LUC sub-suites and LUC sub-suites – a number of new LUC sub-suites and LUC sub-suites are recognised;
- Change in soils classified as LUC Class 2 in the old Taranaki-Manawatu NZLRI legend and database are now revised, updated, and re-classified to LUC Class 3.

These changes are discussed in more detail in the following sections:

Changes to LUC suites and LUC subsuites

LUC suites and LUC subsuites 'group' LUC units into similar physiographic land types and landform/rock/soil combinations and associations (e.g., fluvial plains, terraces, sand country, hill country, greywacke mountainlands, volcanic). A large number of individual LUC units are organised and categorised into recognisable 'family' LUC suites and LUC subsuites (Fig. 3). Land behaviours, capability, limitations, climate, and productivity may vary greatly within suites and sub-suites, but the LUC units are bound by similar, or same, 'core' physical attributes, linked by landform expression and trait, and often mapped together in distinct geographic locations (e.g., sand country, valleys, terraces, downlands, mountainlands).

Because of the expansion of the regional area, from that originally defined as just Taranaki–Manawatu, a number of new land types have been included, e.g., landforms, rocktypes, and soil-types and climate. The extended legend in this project has therefore been expanded to include a number of new LUC suites and sub-suites not seen in the original Taranaki-Manawatu NZLRI legend. Improved definition, characterisation and re-ordering of land types/landscape units from the existing original Taranaki–Manawatu extended legend was required. Some LUC units from the original NZLRI extended legends (for the 6 NZLRI regions) have been reordered and grouped into new LUC suites and LUC subsuites to improve definition of land, LUC subclass, physical attributes and physical limitations.

Using Fletcher 1987 as the base LUC extended legend a number of changes are included in this 2009 Horizons correlation. The full table of LUC suites, LUC *subsuites* and NZLRI LUC units is shown in section 4, Table 5. Below are the LUC suite and subsuite numbers shown in Figure 3. New LUC suites and LUC sub-suites added in this correlation project and additional to those defined in Fletcher 1987 are in bold (i.e. ***new***):

LUC suites, LUC *subsuites* defined for the Horizons Region in this LUC GIS 2009 project:

1. YELLOW BROWN LOAMS 1a. Waimarino 1b. King Country 1c. Inland Plateaux 1d. Taranaki 2. LAHARS IN TARANAKI 3. COASTAL SAND COUNTRY 3a. Younger dune sands – unstable (near coast); ***new*** 3b. Older dune sands – more consolidated and stable (away from coast); ***new*** 4. ALLUVIUM 4a. Wet, poorly drained floodplains and low terraces; ***new*** 4b. Free draining floodplains and low terraces (includes gravels, and stony areas); ***new*** 4c. Stony high terraces; ***new*** 4d. Peat; ***new*** 5. LOESS 5a. Low rainfall (800–1150 mm pa) 5b. High rainfall (1000–1800 mm pa) – e.g., near Ruahine ranges, Apiti 5c. Eastern southern Hawke's Bay region terraces with loess and tephra (e.g., Dannevirke); ***new*** 5d. Loess and tephra covered terrace land (1000–1200 mm pa, e.g., Wellington); ***new*** 6. TAUPO AIRFALL TEPHRA 6a. Shallow Taupo airfall tephra 6b. Deep Taupo airfall tephra 7. TAUPO FLOW TEPHRA AND WATER SORTED TEPHRA	8. NORTH-EAST UPLANDS 8a. Shallow Taupo and/or Ngauruhoe tephra 8b Deep Taupo and/or Ngauruhoe tephra 9. MUDSTONE 9a Jointed mudstone 9b Banded mudstone 10. SILTSTONE 10a Siltstone 10b Urenui siltstone 11. SANDSTONE 11a Unconsolidated 11b. Moderately consolidated 11c. Moderately consolidated with slump and earth-flow erosion 11d. Consolidated 11e. Hard consolidated 12. DEEP SEATED EARTHFLOW AND SLUMP EROSION 13. GREYWACKE 13a. Greywacke ranges (includes foothills); ***new*** 13b. Upland basins and ridges in the Greywacke ranges; ***new*** 13c. Greywacke hill country (some coastal hill country in the Wellington region); ***new*** ***14.*** VOLCANIC ***new*** ***15.*** LIMESTONE ***new*** ***16.*** ARGILLITE ***new***

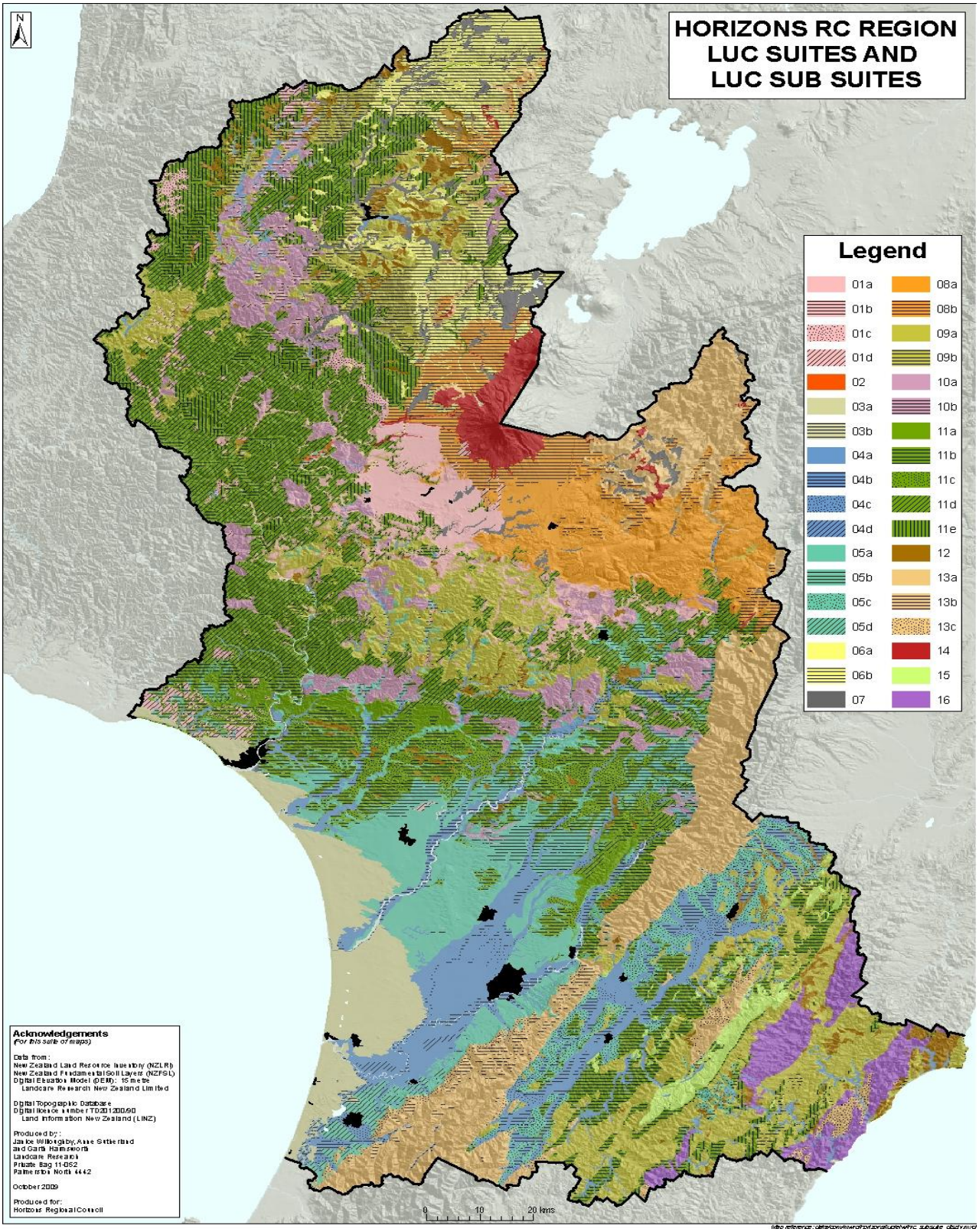

Figure. 3 Horizons Region LUC suites and LUC sub-suites (see section 4, Table 5 for the full suite and LUC subsuite name with new HRC and original NZLRI LUC unit numbers)

Changes in the classification of soils from LUC Class 2 to LUC Class 3

As part of this LUC correlation exercise a large area of NZLRI LUC Class 2 flat land on terraces has been reclassified as LUC Class 3 (Fig. 4). The land is generally flat with soils that have poor to imperfect drainage, poor physical structure, moderate to severe limitations to intensive agricultural use, and moderate to severe limitations for arable use such as horticulture. Because of the land's moderate limitations of poor soil structure, and poor soil drainage characteristics, it does not meet the criteria for LUC Class 2, but meets those required for LUC Class 3, (Lynn et al. 2009). These new Horizons LUC Class 3 areas typically occur on intermediate to high terraces *above* the lower floodplain – low terrace areas, and contain a suite of soils comprising: Ohakea, Milson, Tokomaru, Tokorangi, Crofton and Marton soils.

All these soils occur on intermediate to high terraces above the floodplains in the Manawatu to Rangitikei districts, and much of this land was mapped around Palmerston North. The youngest terrace is the Ohakea terrace. The next oldest terrace is the Milson terrace ranging in elevation from 30 to 60 metres with surface deposits of loess (old windblown river silts and clays), typically with silty clay loam textured soils, and is broadly dissected. The oldest and highest terrace is the Tokomaru terrace ranging from 60 to 90 metres elevation with deeper valleys dissected into it, and clay-textured loessial soils over sands and cemented gravels. The terraces containing the Halcombe, Marton, Crofton, Tokorangi soils are continuations of the medium–high terraces near Palmerston North, and in the area between the Manawatu and the Rangitikei Rivers. They are very similar to the terraces that were mapped during the Wellington NZLRI survey (Edition 2) containing soils that were classified as LUC Class 3 (Page 1995). This convention is followed in this correlation.

This reclassification of LUC Class 2 to LUC Class 3 follows national LUC mapping standards and LUC class, LUC subclass and LUC unit criteria, set out and defined in the new 2009 LUC handbook (Lynn et al. 2009). It also follows the previous soil mapping and documentation by Cowie (1974), Campbell (1979) and more recently Wilde (2003a, b). The Ohakea, Milson, Tokomaru, Tokorangi, Crofton and Marton soils were originally classified as Class 3 soils for Horticultural use by Cowie (1974) and Campbell (1979). Furthermore Wilde (2003a, b) wrote in two reports commissioned by Palmerston North City Council:

> *The land on which Milson and Marton soils occur is not considered by Landcare Research land resource scientists as 'high class' land because the soils do not meet the required criteria, despite the land earlier being classified as LUC unit IIc2 during land-use capability work in the Manawatu Region. Land-use capability work in the Wellington Region classifies similar land as LUC Class III. There are several good technical reasons to reclassify land occupied by Milson and Marton soils as Class III land.*

This reclassification includes all soils of flat and rolling land with severe soil limitations for intensive agriculture and horticulture (Cowie 1974):

- Ohakea silt loam
- Milson silt loam
- Tokomaru silt loam
- Marton silt loam

Limitations of poor drainage and compact subsoils with poor physical structure were described for the:

- Ohakea silt loam
- Tokomaru silt loam
- Marton silt loam
- Tokorangi series
- Crofton series (Cowie 1974; Campbell 1979).

The Milson, Marton, Tokomaru and Tokorangi soils are all classified as Perch-gley Pallic (PP) soils with/without argillic horizons and/or fragipans (Hewitt 1998). The Orthic Brown (BO; Hewitt 1998) Ashhurst soils have been excluded from this grouping as they are more versatile, are well drained to excessively drained with better soil structure, and are more suited to intensive agricultural production. Table 2 shows the soils that have been reclassified from LUC Class 2 to LUC Class3.

Table 2 LUC Class 3 soils, limitations, and LUC correlation

Name of soil	Drainage	Limitation to arable use	Soil structure and fine earth texture	Old NZLRI LUC	New HRC LUC (correlation no.)
Ohakea silt loam, loam, heavy silt loam	Imperfectly to poorly drained	Moderate	Poor, compact, silts to clay	2s2	3s04
Milson silt loam	Imperfectly to poorly drained	Moderate	Poor, compact, silts to clay	2s2	3s04
Tokomaru silt loam	Imperfectly to poorly drained	Moderate	Poor, compact, silts to clay	2s2	3s04
Tokorangi silt loam	Imperfectly to excessively drained	Moderate	Poor, compact, silts to clay	2s2	3s04
Halcombe silt loam	Imperfectly to poorly drained	Moderate	Poor, compact, silts to clay	2s2	3s04
Marton silt loam, black silt loam	Poorly to imperfectly drained	Moderate	Poor, compact, silts to clay	2s2	3s04
Crofton silt loam	Imperfectly drained	Moderate	Poor, compact, silts to clay	2s2	3s04

The HRC land unit, LUC 3s04, now totals 61, 067 ha, of this 55, 321 was reclassified from LUC Class 2 and 5746 ha was previously classified as LUC Class 3.

LUC Class 2 land in the Horizons region

Large areas of NZLRI LUC class 2 land (a total of ~171 435 ha) were mapped and classified in the HRC region as part of the initial NZLRI mapping during the 1980s and 1990s (Fletcher 1987; Page 1995,1988). The area of LUC Class 2 in the Horizons Region has been reduced from 171 434.82 to 116 113.51 ha with this 2009 LUC correlation, and reclassified as LUC Class 3. The 2009 areas for LUC Class 2 and its LUC subclasses are shown in Table 3.

Table 3 LUC Class 2 and subclass areas for the Horizons Regional Council region in 2009

HRC LUC	HRC LUC CLASS	AREA HA	% OF REGION
Class 2	HRC 2e	8909.5	0.4
	HRC 2w	61745.8	2.8
	HRC 2s	28103.8	1.3
	HRC 2c	17354.4	0.8
TOTAL (Class 2)		116113.5	5.2

The spatial distribution of LUC Class 2 is shown in Figure 4. The soils that meet the LUC Class 2 criteria as defined in Lynn *et al.* (2009) are listed in Table 4.

Table 4 Soils meeting the 2009 LUC Class 2 criteria following the recent LUC correlation.

LUC Subclass	**Main Soils included**
2e	Egmont, Kakatahi, Kiwitea, part Marton, Parakino, Pouwhakaura, Westmere
2s	Aria, Ashhurst, Heretaunga, Kairanga, Karapoti, Kopua, Koputaroa, Manawatu, Putiki, Rangitikei, Te Horo, Tukituki
2w	Heretaunga, Kai-iwi, Kairanga, Karapoti, Kawhatau, Kiwitea, Makerua, Manawatu, part Marton, Meeanee-Farndon, Ngauruhoe, Ohakea, Ohinemoa, Opiki, Parewanui, Pouwhakaura, Rongotea, Te Arakura, Utawai.
2c	Dannevirke, Egmont, Kakatahi, Kawhatau, Kiwitea, Kopua, Levin, Matamau, Ohakune, Raumati, Westmere

As shown in Table 4, poorly to imperfectly drained Marton soils (PP/PPX/PPJ; Hewitt 1998) on intermediate to high terraces are now included in 3s04, whereas some Marton silt loams and loams on better drained lower terrace surfaces are still mapped as LUC 2e and LUC 2w.

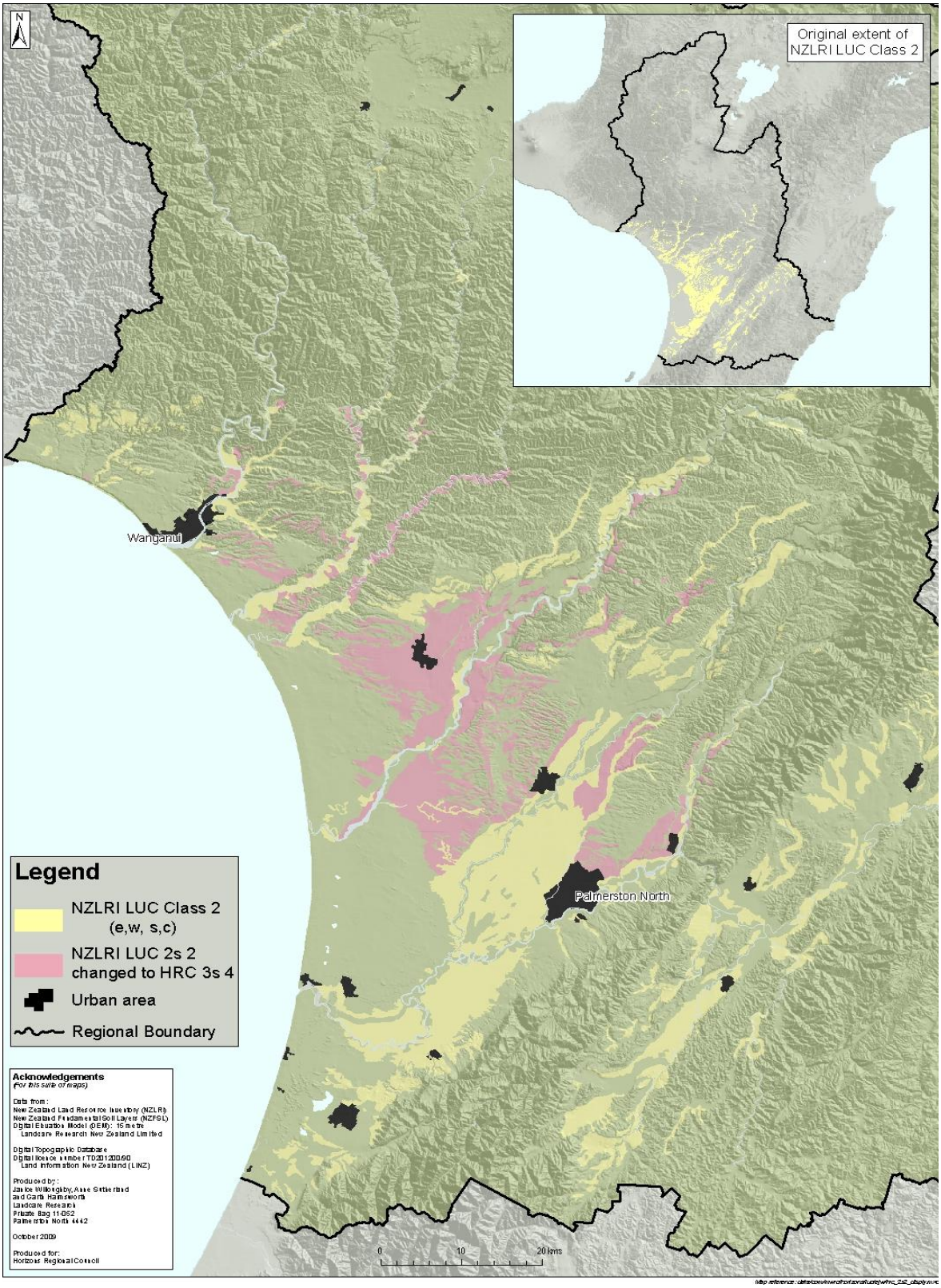

Figure. 4 Changes in LUC Class 2 to LUC Class 3 land

4. LUC Suites, LUC Sub-suites and LUC units in the Horizons Regional Council region

Table 5 LUC suites, sub-suites and LUC units for the HRC region (to accompany the Nov 2009 GIS LUC shapefile)
The table presents the new Horizons RC LUC unit number and national standard ranking established November 09 by Landcare Research NZ Ltd.

LUC suite	HRC LUC correlation no	LUC sub-suite name	NZLRI region	NZLRI LUC units
1. YELLOW BROWN LOAMS	3c01, 3e07, 3w03, 4c02, 4e07, 6c01	1a. Waimarino	Taranaki–Manawatu (10)	2c1, 3e5, 3w3, 3c1, 4e6, 4c1, 6c1
	2s04, 3e01, 4e01, 6s01	1b. King Country	Taranaki–Manawatu (10)	2s4, 3e1, 4e1, 6s1
	4w03, 6e36	1c. Inland Plateaux	Waikato (02)	4e1, 7e6
	1c03, 1w02, 2c03, 2e02, 3c05, 3e03, 3e10, 4e02, 4e08, 5c01, 6e08, 6s01, 7e02, 7e29	1d. Taranaki	Taranaki–Manawatu (10)	4w3, 6e22
			Taranaki–Manawatu (10)	1c3, 1w2, 2e1, 2c3, 3e2, 3e6, 3c4, 4e2, 4e7, 5c1, 6e6, 7e18 6e1, 7e1
			Waikato (02)	
2. LAHARS IN TARANAKI	6s09		Taranaki–Manawatu (10)	3w3, 6s6

LUC suite	HRC LUC correlation no	LUC sub-suite name	NZLRI region	NZLRI LUC units
3. COASTAL SAND COUNTRY	3w04, 4e12, 6e38, 6s04, 6s10, 7e25, 8e01	3a. Younger dune sands – unstable (near coast); *new*	Taranaki–Manawatu (10) Wellington (09) Southern Hawke's Bay–Wairarapa (08)	3w4, 4e10, 6e24, 6s4, 7e15, 8e1 3w3, 4e4, 6e5, 6s4, 6s5, 7e3, 8e1 6e14, 7e14, 8e4
	3s04, 6e14	3b. Older dune sands – more consolidated and stable (away from coast); *new*	Wellington (09)	2s2, 3e2, 6e4
4. ALLUVIUM	1w01, 2w01, 2w02, 2w03, 3w01, 3w02, 4w01, 4w02, 7w01	4a. Wet, poorly drained floodplains and low terraces; *new*	Taranaki–Manawatu (10) Wellington (09) Southern Hawke's Bay–Wairarapa (08)	1w1, 2w1, 2w2, 2w4, 3w1, 3w2, 4w1, 4w2 1w1, 2w1, 2w2, 3w1, 7w2
	1s01, 2s01, 2s02, 3s01, 3s02, 4s01, 6s11, 7s01	4b. Free draining floodplains and low terraces (includes gravels, and stony areas); *new*	Taranaki–Manawatu (10) Wellington (09) Southern Hawke's Bay–Wairarapa (08)	1w1, 2w1, 3w2, 3w1, 4w1 2s1, 3s2, 4s2, 6s7 1s1, 2s1, 3s1, 4s1, 6s7, 7s2
	2s05, 3s01, 4s02	4c. Stony high terraces; *new*	Taranaki–Manawatu (10) Wellington (09) Southern Hawke's Bay–Wairarapa (08)	2s1, 3s2, 4s1, 7s1 3s2, 4s2 2s2, 3s2, 4s2
	2w03, 3w05, 4w05	4d. Peat; *new*	Taranaki–Manawatu (10) Wellington (09)	3s2, 4s1 2w4 2w2, 3w2, 4w3

LUC suite	HRC LUC correlation no	LUC sub-suite name	NZLRI region	NZLRI LUC units
5. LOESS	2s03, 3s04, 3e06, 4e04, 6e01 1c02, 2c01, 2e03, 3c02, 3e04, 4e03, 6c04 2c01, 3e05, 4e03, 6e02, 6e15, 6s03 1c01, 2c02, 2e01, 3e02	5a. Low rainfall (800–1150 mm pa) 5b. High rainfall (1000–1800 mm pa) – e.g., near Ruahine ranges, Apiti 5c. Eastern southern Hawke's Bay region terraces with loess and tephra (e.g., Dannevirke); *new* 5d. Loess and tephra covered terrace land (1000–1200 mm pa, e.g., Wellington); *new*	Taranaki–Manawatu (10) Wellington (09) Taranaki–Manawatu (10) Southern Hawke's Bay–Wairarapa (08) Wellington (09)	2s2, 3e4, 4e4, 6e2 3s4, 3e3, 4e2, 6e1, 6e4 1c2, 2e2, 2c1, 3e3, 3c2, 4e3, 6c2 2c1, 3s1, 3e1, 4e1, 6e1, 6e4, 6s1 1c1, 2e1, 2c1, 3e1, 6e1
6. TAUPO AIRFALL TEPHRA	4e06, 5s01, 6e11, 6s02, 6s12, 7s03 3e09, 3e11, 3s03, 4e11, 4e13, 4e14, 4e17, 4e22, 6e18, 6e30, 6s05, 7e12	6a. Shallow Taupo airfall tephra 6b. Deep Taupo airfall tephra	Taranaki–Manawatu (10) Taranaki–Manawatu (10) Bay of Plenty (04)	4e5, 5s2, 6e9, 6s2, 6s8, 7s1 3e7, 3s4, 4e9, 6e18, 6s5, 7e8 3e6, pt 4e6, pt 4e8, pt 4e16, 4e6, 4e8, 4e9, 4e16, 6e9, 6s2, 7e6

LUC suite	HRC LUC correlation no	LUC sub-suite name	NZLRI region	NZLRI LUC units
7. TAUPO FLOW TEPHRA AND WATER SORTED TEPHRA	2s06, 3e12, 3s06, 4e18, 4e20, 4e21, 4e23, 4s03, 4w04, 6e39, 6w01, 7e31, 7e39, 8e02, 8w01		Taranaki–Manawatu (10) Northern Hawke's Bay (07) Bay of Plenty (04)	2s5, 3e8, 3s6, 4e11, 4e13, 4e14, 4w4, 4s3, 6e26, 6w1, 7e19, 7e26, 8e2, 8e10, 8w1 4w2 4e13, 4e18, 6e24, 7e12
8. NORTH-EAST UPLANDS	3c04, 4c03, 4e19, 6c05, 6e40, 7e33, 7e34, 7e35, 7e36, 7e37 4c04, 6c06, 6c07, 7c01, 7e37, 7e38, 8e12	8a. Shallow Taupo and/or Ngauruhoe tephra 8b Deep Taupo and/or Ngauruhoe tephra	Taranaki–Manawatu (10) Northern Hawke's Bay (07) Taranaki–Manawatu (10) Northern Hawke's Bay (07) Bay of Plenty (04)	3c3, 4e12, 4c2, 6e27, 6c3, 7e21, 7e22, 7e23 4e4, 6e16, 6c2, 7e12, 7e18 4c4, 6c4, 7e24, 7e25, 7c1, 8e10 7e17 6c1, 7c1, 8e5

LUC suite	HRC LUC correlation no	LUC sub-suite name	NZLRI region	NZLRI LUC units
9. MUDSTONE	3e08, 3s05, 4e09, 6e03, 6e04, 6e05, 6e06, 6e20, 7e01, 7e03, 7e11, 7e24, 8e03	9a Jointed mudstone	Taranaki–Manawatu (10) Southern Hawke's Bay–Wairarapa (08)	6e3, 6e4, 7e1, 7e2, 8e3 3e3, 3s3, 4e3, 6e2, 6e3, 6e7, 6e8, 7e1, 7e12,
	6e07, 7e05, 7e11, 8e03, 8e04	9b Banded mudstone	Waikato (02) Taranaki–Manawatu (10) Southern Hawke's Bay–Wairarapa (08)	6e9 6e5, 7e7, 8e3 7e2, 8e2
10. SILTSTONE	6e09, 6e10, 6e12, 7e05, 7e13	10a Siltstone	Taranaki–Manawatu (10)	6e7, 6e8, 6e10, 7e4, 7e9, 8e3
	7e32	10b Urenui siltstone	Taranaki–Manawatu (10)	7e20, 8e3

LUC suite	HRC LUC correlation no	LUC sub-suite name	NZLRI region	NZLRI LUC units
11. SANDSTONE	6e17, 6e22, 7e27, 8e02	11a Unconsolidated	Taranaki–Manawatu (10)	6e12, 6e14, 7e16, 8e2
	6e17, 6e22, 7e04, 7e07, 8e03	11b. Moderately consolidated	Taranaki–Manawatu (10) Wellington (09) Southern Hawke's Bay–Wairarapa (08)	6e12, 6e14, 7e3, 7e5, 8e3 6e1 6e9, pt 7e4
	6e13, 7e08	11c. Moderately consolidated with slump and earth-flow erosion	Taranaki–Manawatu (10)	6e11, 7e6
	6e21, 6e23, 6e37, 7e16, 7e21, 7e30, 8e03	11d. Consolidated	Taranaki–Manawatu (10)	6e13, 6e15, 6e23, 7e11, 7e13, 8e3 8e1 7e11
	6e19, 6e29, 6s07, 7e28, 7s02	11e. Hard consolidated	Southern Hawke's Bay–Wairarapa (08) Bay of Plenty (04) Taranaki–Manawatu (10) Southern Hawke's Bay–Wairarapa (08) Waikato (02)	6e17, 7e17, 8e3 6s2, 7s2, 8e1 6e7
12. DEEP SEATED EARTHFLOW AND SLUMP EROSION	4e10, 6e31, 6e32, 6e33, 7e20, 7e22, 7e23		Taranaki–Manawatu (10) Southern Hawke's Bay–Wairarapa (08) Waikato (02)	4e8, 6e19, 6e20, 7e12, 7e14 6e10, pt 7e8, 7e9 7e4

LUC suite	HRC LUC correlation no	LUC sub-suite name	NZLRI region	NZLRI LUC units
13. GREYWACKE	6e25, 6e28, 7e14, 7e15, 8c01, 8e05, 8e06, 8e07, 8e08, 8e09, 8e10, 8e11	13a. Greywacke ranges (includes foothills); *new*	Taranaki–Manawatu (10) Wellington (09) Southern Hawke's Bay–Wairarapa (08) Northern Hawke's Bay (07) Bay of Plenty (04)	6e16, 7e10, 8e4, 8e5, 8e6, 8e7, 8e8, 8e9, 8c1 6e8, 6e10, 7e2, 7e5, 8e3, 8e4, 8e5 6e11, pt 7e10, 8e5, 8e6, 8e8, 8e9, 8c1 8e5, 8e6, 8e9, 8e10, 8e11
	3c03, 4c01, 4e16, 6c02, 7c02 6e24, 6e27, 6s06, 6s08, 7e09, 7e10	13b. Upland basins and ridges in the Greywacke ranges; *new* 13c. Greywacke hill country (some coastal hill country in the Wellington region); *new*	Waikato (02) Wellington (09) Wellington (09) Southern Hawke's Bay–Wairarapa (08)	8e3, 8e6, 8e7, 8c1 8e1 3c1, 4e5, 4c1, 6c1, 7c1 6e6, 6s6, 6e9, 7e1 6s3, 7e5
14. VOLCANIC *new*	8c01, 8e05, 8e08, 8e09, 8e11		Taranaki–Manawatu (10) Bay of Plenty (04)	8e4, 8e7, 8e8, 8e9, 8c1 8e3, 8e6, 8e7, 8c1

LUC suite	HRC LUC correlation no	LUC sub-suite name	NZLRI region	NZLRI LUC units
15. LIMESTONE *new*	4e05, 5c02, 6c01, 6c03, 6e16, 7e06, 7e07, 8e03		Southern Hawke's Bay–Wairarapa (08)	4e4, 5c1, 6e5, 6c1, 6c2, 7e3
16. ARGILLITE *new*	3s07, 4e15, 6e34, 6e35, 7e17, 7e18, 7e19, 8e03,		Southern Hawke's Bay–Wairarapa (08)	3s4, 4e5, 6e12, 6e13, 7e6, 7e7, 7e11

5. Conclusions

A regional LUC GIS database (shapefile) – with single Horizons LUC numbering schema – was produced for the HRC administration area between July and December 2009. This GIS exercise was based on a previous LUC correlation project which essentially did a 'first cut' LUC correlation for the region (Harmsworth & Page 2009). In this new LUC GIS project the data from the previous report were first entered into a excel spreadsheet, and then converted into a GIS shapefile, where they were then checked, validated, and corrected, and specific changes were made. The completed HRC regional GIS LUC database comprises 288 unique LUC units from 6 separate NZLRI regions. These LUC units were then grouped into 16 LUC suites and 30 LUC sub-suites for the HRC region. The LUC correlation GIS database was sent to HRC in early November 2009 as a large GIS shapefile, representing over 1626 unique LUC attribute combinations and 36 different fields of data for each LUC combination. The regional LUC database and GIS maps can be used to generate a range of data, maps and statistics for research, policy and planning.

The lack of a comprehensive single regional LUC correlation across the HRC area has historically been an obstacle for linking, interpreting, and mapping LUC units from one side of the Horizons region to the other. This new regional LUC GIS database will allow detailed regional–local analyses to better inform research, planning and policy. Based on improved definition of LUC and inventory data it will underpin a range of operational activities for the council and enable improved regional and catchment mapping, physical resource and LUC assessment, analyses, and modeling, to help achieve agreed outcomes for future sustainable land management planning and policy. The regional GIS LUC database is more consistent and better aligns with LUC classification criteria specified in the 2009 3rd edition NZ LUC survey handbook (Lynn et al. 2009).

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8. Appendix

Tables showing new Horizons LUC classification numbers, existing original NZLRI LUC numbers, existing and new LUC suite and subsuite numbers, and NZLRI regional legend numbers.

FREQ	SUB_CODE	RC_UNIT_NO	LEGEND	NZLRI LUC	ROCK
1	01a	HRC 3c01	10	3c 1	(Mo)/Mm
1	01a	HRC 3c01	10	3c 1	(Mo)/Sm
4	01a	HRC 3c01	10	3c 1	Al+Mo
1	01a	HRC 3c01	10	3c 1	Al/Mo
13	01a	HRC 3c01	10	3c 1	Mo
12	01a	HRC 3c01	10	3c 1	Mo+Al
2	01a	HRC 3c01	10	3c 1	Mo+Al/La
2	01a	HRC 3c01	10	3c 1	Mo/Al
47	01a	HRC 3c01	10	3c 1	Mo/La
2	01a	HRC 3c01	10	3c 1	Mo/La+Al
7	01a	HRC 3c01	10	3c 1	Mo/Mj
2	01a	HRC 3c01	10	3c 1	Mo/Mm
16	01a	HRC 3c01	10	3c 1	Mo/Sm
1	01a	HRC 3c01	10	3c 1	Mo/Sm+Al
2	01a	HRC 3c01+HRC 4e07	10	3c 1+4e 6	Mo
1	01a	HRC 3c01+HRC 4e07	10	3c 1+4e 6	Mo+Al
2	01a	HRC 3c01+HRC 4e07	10	3c 1+4e 6	Mo/Mj
1	01a	HRC 3c01+HRC 6e08	10	3c 1+6e 6	Mo+Mo/Sm
3	01a	HRC 3e07	10	3e 5	(Mo)/Mm
6	01a	HRC 3e07	10	3e 5	(Mo)/Sm
9	01a	HRC 3e07	10	3e 5	Mo
3	01a	HRC 3e07	10	3e 5	Mo+Al
2	01a	HRC 3e07	10	3e 5	Mo+Al/La
1	01a	HRC 3e07	10	3e 5	Mo/(La)/Sm
2	01a	HRC 3e07	10	3e 5	Mo/Gr
29	01a	HRC 3e07	10	3e 5	Mo/La
9	01a	HRC 3e07	10	3e 5	Mo/La/Sm
14	01a	HRC 3e07	10	3e 5	Mo/Mj
9	01a	HRC 3e07	10	3e 5	Mo/Mm
14	01a	HRC 3e07	10	3e 5	Mo/Sm
1	01a	HRC 3e07	10	3e 5	Sm
1	01a	HRC 3e07+HRC 8e03	10	3e 5+8e 3	(Mo)/Mm
2	01a	HRC 3w03	10	3w 3	Al
1	01a	HRC 3w03	10	3w 3	Al+Mo
2	01a	HRC 3w03	10	3w 3	Al+Mo/La
1	01a	HRC 3w03	10	3w 3	Al/Mo
2	01a	HRC 3w03	10	3w 3	Mo
1	01a	HRC 3w03	10	3w 3	Mo/Al
1	01a	HRC 3w03	10	3w 3	Mo/La
1	01a	HRC 4c02	10	4c 1	Al+Mo

12	01a	HRC 4c02	10	4c 1	Mo
11	01a	HRC 4c02	10	4c 1	Mo/La
4	01a	HRC 4c02	10	4c 1	Mo/La/Sm
6	01a	HRC 4c02	10	4c 1	Mo/Sm
1	01a	HRC 4c02+HRC 6e09	10	4c 1+6e 7	(Mo)/Sm+Li
5	01a	HRC 4e07	10	4e 6	(Mo)/Mj
1	01a	HRC 4e07	10	4e 6	(Mo)/Mj+La
3	01a	HRC 4e07	10	4e 6	(Mo)/Mm
16	01a	HRC 4e07	10	4e 6	(Mo)/Sm
1	01a	HRC 4e07	10	4e 6	(Mo)/Sm+La
1	01a	HRC 4e07	10	4e 6	Mm
3	01a	HRC 4e07	10	4e 6	Mo
1	01a	HRC 4e07	10	4e 6	Mo+Al
2	01a	HRC 4e07	10	4e 6	Mo+La
1	01a	HRC 4e07	10	4e 6	Mo+Tp/Sm
6	01a	HRC 4e07	10	4e 6	Mo/La
3	01a	HRC 4e07	10	4e 6	Mo/La/Mm
14	01a	HRC 4e07	10	4e 6	Mo/Mj
13	01a	HRC 4e07	10	4e 6	Mo/Mm
1	01a	HRC 4e07	10	4e 6	Mo/Mm+Al
2	01a	HRC 4e07	10	4e 6	Mo/Mm+La
62	01a	HRC 4e07	10	4e 6	Mo/Sm
2	01a	HRC 4e07	10	4e 6	Mo/Sm+Al
1	01a	HRC 4e07	10	4e 6	Mo/Vo
1	01a	HRC 4e07	10	4e 6	Sm
1	01a	HRC 4e07+HRC 6e05	10	4e 6+6e 3	Mo/Mm
2	01a	HRC 4e07+HRC 6e37	10	4e 6+6e23	(Mo)/Sm+La
1	01a	HRC 6c01	10	6c 1	(Mo)/La+Sm
2	01a	HRC 6c01	10	6c 1	(Mo)/Mj
1	01a	HRC 6c01	10	6c 1	(Mo)/Mm
2	01a	HRC 6c01	10	6c 1	(Mo)/Mm+Sm
29	01a	HRC 6c01	10	6c 1	(Mo)/Sm
1	01a	HRC 6c01	10	6c 1	Mm
3	01a	HRC 6c01	10	6c 1	Mo/La
1	01a	HRC 6c01	10	6c 1	Mo/La+Mm
1	01a	HRC 6c01	10	6c 1	Mo/La/Mm
5	01a	HRC 6c01	10	6c 1	Mo/La/Sm
3	01a	HRC 6c01	10	6c 1	Mo/Mj
10	01a	HRC 6c01	10	6c 1	Mo/Mm
84	01a	HRC 6c01	10	6c 1	Mo/Sm
1	01a	HRC 6c01	10	6c 1	Mo/Sm+Mj
4	01a	HRC 6c01	10	6c 1	Sm
1	01a	HRC 6c01+HRC 3c01	10	6c 1+3c 1	(Mo)/Mj+Al
1	01a	HRC 6c01+HRC 3w02	10	6c 1+3w 2	(Mo)/Sm+Al
1	01b	HRC 2s04	10	2s 4	Mo
4	01b	HRC 2s04	10	2s 4	Mo/Al
1	01b	HRC 3e01	10	3e 1	Al
6	01b	HRC 3e01	10	3e 1	Mo
1	01b	HRC 3e01	10	3e 1	Mo+Al

1	01b	HRC 3e01	10	3e 1	Mo/Al
1	01b	HRC 3e01	10	3e 1	Mo/La
1	01b	HRC 3e01	10	3e 1	Mo/Mb
1	01b	HRC 3e01	10	3e 1	Mo/Mb+Tp
1	01b	HRC 3e01	10	3e 1	Mo/Mj
1	01b	HRC 3e01	10	3e 1	Mo/Mm
3	01b	HRC 3e01+HRC 6e05	10	3e 1+6e 3	Mo/Mj
1	01b	HRC 4e01	02	4e 1	(Mo)/Mb
2	01b	HRC 4e01	02	4e 1	Mo
2	01b	HRC 4e01	10	4e 1	(Mo)/Mm
22	01b	HRC 4e01	10	4e 1	Mo
1	01b	HRC 4e01	10	4e 1	Mo/Al
1	01b	HRC 4e01	10	4e 1	Mo/Gr/Mm
7	01b	HRC 4e01	10	4e 1	Mo/Mm
1	01b	HRC 4e01+HRC 6s01	10	4e 1+6s 1	Mo/Mm
6	01b	HRC 6s01	10	6s 1	(Mo)/Mb
2	01b	HRC 6s01	10	6s 1	(Mo)/Mb+Mm
6	01b	HRC 6s01	10	6s 1	(Mo)/Mm
14	01b	HRC 6s01	10	6s 1	(Mo)/Sm
2	01b	HRC 6s01	10	6s 1	(Mo)/Sm+Mb
1	01b	HRC 6s01	10	6s 1	Mo/Mb
9	01b	HRC 6s01	10	6s 1	Mo/Mj
3	01b	HRC 6s01	10	6s 1	Mo/Mj+Mm
7	01b	HRC 6s01	10	6s 1	Mo/Mm
3	01b	HRC 6s01	10	6s 1	Mo/Sm
1	01b	HRC 7e26	02	7e 6	(Mo)/Vo
3	01c	HRC 4w03	10	4w 3	Al+Pt
4	01c	HRC 4w03	10	4w 3	Al+Pt+Mo
4	01c	HRC 4w03	10	4w 3	Mo+Al
3	01c	HRC 4w03	10	4w 3	Mo+Al+Pt
2	01c	HRC 4w03	10	4w 3	Mo+Pt
2	01c	HRC 6e36	10	6e22	(Mo)/Sm
39	01c	HRC 6e36	10	6e22	Mo/Sm
2	01c	HRC 6e36	10	6e22	Mo/Sm+Mm
13	01d	HRC 1c03	10	1c 3	Lo+Mo
3	01d	HRC 1c03	10	1c 3	Lo/Mo
2	01d	HRC 1c03	10	1c 3	Mo+Lo
2	01d	HRC 1w02	10	1w 2	Lo
6	01d	HRC 1w02	10	1w 2	Lo+Mo
11	01d	HRC 2c03	10	2c 3	Mo+Lo
1	01d	HRC 2c03+HRC 4e03	10	2c 3+4e 3	Mo/Sm
1	01d	HRC 2e02	10	2e 1	Lo+Mo
3	01d	HRC 2e02	10	2e 1	Mo+Lo
2	01d	HRC 3c05	10	3c 4	Al+Mo
3	01d	HRC 3c05	10	3c 4	Mo
2	01d	HRC 3c05+HRC 6e08	10	3c 4+6e 6	Al+Mo
1	01d	HRC 3e03	10	3e 2	Mo+Lo
1	01d	HRC 3e10	10	3e 6	Mo+Al

1	01d	HRC 4e02	10	4e 2	Mo/Sm
18	01d	HRC 4e08	10	4e 7	Mo
1	01d	HRC 4e08	10	4e 7	Mo/Sm
1	01d	HRC 5c01	10	5c 1	(Mo)/Sm
1	01d	HRC 5c01	10	5c 1	(Mo)/Sm+Li
2	01d	HRC 5c01	10	5c 1	Mo/Sm+Li
2	01d	HRC 6e08	10	6e 6	Mo/Mm+Sm
26	01d	HRC 6e08	10	6e 6	Mo/Sm
1	01d	HRC 6e08+HRC 3c05	10	6e 6+3c 4	Mo/Sm+Al
2	01d	HRC 6s01	02	6e 1	(Mo)/Sm
2	01d	HRC 6s01	02	6e 1	Mo/Sm
5	01d	HRC 7e02	02	7e 1	Mb
1	01d	HRC 7e02	02	7e 1	Mb+Sm
14	01d	HRC 7e02	02	7e 1	Sm
2	01d	HRC 7e29	10	7e18	Mo/Vo
1	02	HRC 6s09	10	6s 6	(Mo)/La+Gr
1	03a	HRC 3w04	09	3w 3	Al
17	03a	HRC 3w04	09	3w 3	Wb
2	03a	HRC 3w04	10	3w 4	(Wb)/Sm
1	03a	HRC 3w04	10	3w 4	Pt
86	03a	HRC 3w04	10	3w 4	Wb
2	03a	HRC 3w04	10	3w 4	Wb+Pt
1	03a	HRC 3w04+HRC 6e38	09	3w 3+6e 5	Wb
1	03a	HRC 3w04+HRC 6s04	09	3w 3+6s 4	Wb
7	03a	HRC 3w04+HRC 6s10	09	3w 3+6s 5	Wb
40	03a	HRC 3w04+HRC 6e38	10	3w 4+6e24	Wb
12	03a	HRC 3w04+HRC 7e25	10	3w 4+7e15	Wb
5	03a	HRC 4e12	09	4e 4	Wb
38	03a	HRC 4e12	10	4e10	Wb
2	03a	HRC 4e12+HRC 6s10	09	4e 4+6s 5	Wb
27	03a	HRC 4e12+HRC 6e38	10	4e10+6e24	Wb
1	03a	HRC 4e12+HRC 6s04	10	4e10+6s 4	Wb
11	03a	HRC 4e12+HRC 7e25	10	4e10+7e15	Wb
2	03a	HRC 6e38	08	6e14	Wb
22	03a	HRC 6e38	09	6e 5	Wb
1	03a	HRC 6e38	10	6e24	Lo
58	03a	HRC 6e38	10	6e24	Wb
1	03a	HRC 6e38+HRC 3w05	09	6e 5+3w 2	Wb+Pt
2	03a	HRC 6e38+HRC 4e12	09	6e 5+4e 4	Wb
2	03a	HRC 6e38+HRC 4w05	09	6e 5+4w 3	Wb
1	03a	HRC 6e38+HRC 2w03	10	6e24+2w 4	Wb
5	03a	HRC 6e38+HRC 3w04	10	6e24+3w 4	Wb
2	03a	HRC 6e38+HRC 4e12	10	6e24+4e10	Wb
8	03a	HRC 6e38+HRC 7e25	10	6e24+7e15	Wb
5	03a	HRC 6s04	09	6s 4	Wb
16	03a	HRC 6s04	10	6s 4	Wb
1	03a	HRC 6s04	10	6s 4	Wb+Gr/Sm
1	03a	HRC 6s04	10	6s 4	Wb/Sb

1	03a	HRC 6s04+HRC 7e25	09	6s 4+7e 3	Wb
29	03a	HRC 6s04+HRC 7e25	10	6s 4+7e15	Wb
4	03a	HRC 6s10	09	6s 5	Wb
1	03a	HRC 6s10+HRC 6e38	09	6s 5+6e 5	Wb
3	03a	HRC 7e25	08	7e14	Wb
1	03a	HRC 7e25	08	7e14	Wb/Mb
1	03a	HRC 7e25	08	7e14	Wb/Mj
25	03a	HRC 7e25	09	7e 3	Wb
1	03a	HRC 7e25	10	7e15	Al
79	03a	HRC 7e25	10	7e15	Wb
6	03a	HRC 7e25+HRC 6s04	09	7e 3+6s 4	Wb
3	03a	HRC 7e25+HRC 3w04	10	7e15+3w 4	Wb
5	03a	HRC 7e25+HRC 4e12	10	7e15+4e10	Wb
1	03a	HRC 7e25+HRC 6e06	10	7e15+6e 4	Wb
4	03a	HRC 7e25+HRC 6e38	10	7e15+6e24	Wb
3	03a	HRC 7e25+HRC 6s04	10	7e15+6s 4	Wb
1	03a	HRC 8e01	08	8e 4	Wb
1	03a	HRC 8e01	09	8e 1	Gw
10	03a	HRC 8e01	09	8e 1	Wb
1	03a	HRC 8e01	10	8e 1	Al/Gr
1	03a	HRC 8e01	10	8e 1	Ng/Kt/Mo
7	03a	HRC 8e01	10	8e 1	Wb
1	03a	HRC 8e01	10	8e 1	Wb+Al
1	03b	HRC 3s04	09	2s 2	Us
2	03b	HRC 6e14	09	6e 4	Wb
2	04a	HRC 1w01	08	1w 1	Al
9	04a	HRC 1w01	09	1w 1	Al
48	04a	HRC 1w01	10	1w 1	Al
9	04a	HRC 1w01	10	1w 1	Al/Gr
2	04a	HRC 1w01+HRC 4s02	10	1w 1+4s 2	Al
17	04a	HRC 2w01	10	2w 1	Al
1	04a	HRC 2w01	10	2w 1	Al+Gr
30	04a	HRC 2w02	08	2w 1	Al
2	04a	HRC 2w02	08	2w 1	Al+(Lo)/Gr
1	04a	HRC 2w02	08	2w 1	Al+Gr
3	04a	HRC 2w02	08	2w 1	Al/Gr
1	04a	HRC 2w02	08	2w 1	Lo/Gr
1	04a	HRC 2w02	09	2w 1	Af+Lo
21	04a	HRC 2w02	09	2w 1	Al
1	04a	HRC 2w02	09	2w 1	Al+Gr
131	04a	HRC 2w02	10	2w 2	Al
1	04a	HRC 2w02	10	2w 2	Al+Lo
1	04a	HRC 2w02	10	2w 2	Al+Pt
5	04a	HRC 2w02	10	2w 2	Al/Gr
3	04a	HRC 2w02	10	2w 2	Gr+Al
1	04a	HRC 2w02	10	2w 2	Lo+Al/Gr
1	04a	HRC 2w02	10	2w 2	Lo/Gr
1	04a	HRC 2w02+HRC 7e08	10	2w 2+7e 6	Lo+Sm

2	04a	HRC 2w02+HRC 8e03	10	2w 2+8e 3	Al/Gr+Sm
1	04a	HRC 2w03	09	2w 2	Al+Pt
1	04a	HRC 2w03	09	2w 2	Al/Pt
3	04a	HRC 2w03	10	2w 4	Al
6	04a	HRC 2w03	10	2w 4	Al+Pt
1	04a	HRC 3w01	08	3w 2	(Lo)/Gr
8	04a	HRC 3w01	08	3w 2	Al
1	04a	HRC 3w01	08	3w 2	Al+Us
4	04a	HRC 3w01	08	3w 2	Al/Gr
1	04a	HRC 3w01	08	3w 2	Lo/Gr
16	04a	HRC 3w01	10	3w 1	Al
1	04a	HRC 3w01	10	3w 1	Al+Mo
1	04a	HRC 3w01+HRC 7e04	08	3w 2+7e 4	Al+Sm
2	04a	HRC 3w02	08	3w 1	(Lo)/Gr
56	04a	HRC 3w02	08	3w 1	Al
1	04a	HRC 3w02	08	3w 1	Al+(Gr)
1	04a	HRC 3w02	08	3w 1	Al+Gr
1	04a	HRC 3w02	08	3w 1	Al/Gr
2	04a	HRC 3w02	08	3w 1	Lo/Gr
6	04a	HRC 3w02	09	3w 1	Al
1	04a	HRC 3w02	09	3w 1	Al+Gr
1	04a	HRC 3w02	10	3w 2	(Mo)/Sm
53	04a	HRC 3w02	10	3w 2	Al
1	04a	HRC 3w02	10	3w 2	Al+Lo
2	04a	HRC 3w02	10	3w 2	Al+Mo
2	04a	HRC 3w02	10	3w 2	Al+Sm
1	04a	HRC 3w02	10	3w 2	Al+Tp
2	04a	HRC 3w02	10	3w 2	Al/Gr
3	04a	HRC 3w02	10	3w 2	Al/Mm
1	04a	HRC 3w02	10	3w 2	Lo/Gr
1	04a	HRC 3w02	10	3w 2	Mm
2	04a	HRC 3w02	10	3w 2	Mo
6	04a	HRC 3w02	10	3w 2	Mo+Al
1	04a	HRC 3w02	10	3w 2	Mo/Mm+Al
2	04a	HRC 3w02	10	3w 2	Sm
4	04a	HRC 3w02+HRC 3s05	08	3w 1+3s 3	Al
1	04a	HRC 3w02+HRC 7e11	08	3w 1+7e 2	Al+Mb
1	04a	HRC 3w02+HRC 4e04	09	3w 1+4e 2	Af+Lo
1	04a	HRC 3w02+HRC 8e03	10	3w 2+8e 3	Al+Mm
18	04a	HRC 4w01	10	4w 1	Al
3	04a	HRC 4w01	10	4w 1	Al+Sm
1	04a	HRC 4w01	10	4w 1	Al/Mm
1	04a	HRC 4w01	10	4w 1	Mm+Al
1	04a	HRC 4w01	10	4w 1	Mo+Al
1	04a	HRC 4w01+HRC 3e01	10	4w 1+3e 1	Al+Mo
10	04a	HRC 4w02	08	4w 1	Al
1	04a	HRC 4w02	08	4w 1	Gr+Al
1	04a	HRC 4w02	08	4w 1	Lo/Gr

4	04a	HRC 4w02	10	4w 2	Al
1	04a	HRC 4w02	10	4w 2	Al+Mo
2	04a	HRC 7w01	09	7w 2	Al
3	04b	HRC 1s01	09	1s 1	Al
2	04b	HRC 1s01+HRC 2s01	09	1s 1+2s 1	Al
4	04b	HRC 2s01	09	2s 1	Al
1	04b	HRC 2s01	09	2s 1	Al+Gr
4	04b	HRC 2s01	09	2s 1	Al/Gr
1	04b	HRC 2s01	09	2s 1	Al/Wb
38	04b	HRC 2s01	10	2s 1	Al
1	04b	HRC 2s01	10	2s 1	Al+Gr
9	04b	HRC 2s01	10	2s 1	Al/Gr
12	04b	HRC 2s02	08	2s 1	(Lo)/Gr
3	04b	HRC 2s02	08	2s 1	(Lo)/Gr+Al
4	04b	HRC 2s02	08	2s 1	Al
1	04b	HRC 2s02	08	2s 1	Al+Gr
1	04b	HRC 2s02	08	2s 1	Al+Lo/Gr
1	04b	HRC 2s02	08	2s 1	Al/Gr
8	04b	HRC 2s02	08	2s 1	Gr
62	04b	HRC 2s02	08	2s 1	Lo/Gr
1	04b	HRC 2s02	08	2s 1	Lo/Gr+Al
1	04b	HRC 2s02+HRC 7e04	08	2s 1+7e 4	(Lo)/Gr/Sm
1	04b	HRC 3s01	08	3s 2	Al
2	04b	HRC 3s01	08	3s 2	Al/Gr
7	04b	HRC 3s01	10	3s 2	Al
3	04b	HRC 3s01	10	3s 2	Al+Gr
20	04b	HRC 3s01	10	3s 2	Al/Gr
2	04b	HRC 3s02	09	3s 1	Al/Gr
15	04b	HRC 4s01	09	4s 1	Al
2	04b	HRC 4s01	09	4s 1	Al+Gr
3	04b	HRC 4s01	09	4s 1	Al/Gr
1	04b	HRC 4s01	09	4s 1	Gr+Al
26	04b	HRC 4s01	10	4s 2	Al
15	04b	HRC 4s01	10	4s 2	Al+Gr
3	04b	HRC 4s01	10	4s 2	Al/Gr
7	04b	HRC 6s11	09	6s 7	Al+Gr
4	04b	HRC 6s11	09	6s 7	Gr
2	04b	HRC 6s11	10	6s 7	Al
17	04b	HRC 6s11	10	6s 7	Al+Gr
3	04b	HRC 6s11	10	6s 7	Al/Gr
3	04b	HRC 6s11	10	6s 7	Gr
1	04b	HRC 6s11+HRC 7e13	10	6s 7+7e 9	Gr+Mm
1	04b	HRC 6s11+HRC 7e13	10	6s 7+7e 9	Gr+Sm
4	04b	HRC 7s01	08	7s 1	Gr
2	04b	HRC 7s01	09	7s 2	Gr
1	04c	HRC 2s05	09	2s 3	Al/Gr
1	04c	HRC 2s05	09	2s 3	Lo
4	04c	HRC 3s01	08	3s 2	(Lo)/Gr

26	04c	HRC 3s01	08	3s 2	Gr
1	04c	HRC 3s01	08	3s 2	Gr+Al
3	04c	HRC 3s01	08	3s 2	Lo/Gr
1	04c	HRC 3s01	09	3s 2	(Al)/Gr
1	04c	HRC 3s01	09	3s 2	Al+Gr
10	04c	HRC 3s01	09	3s 2	Al/Gr
10	04c	HRC 3s01	10	3s 2	Gr
3	04c	HRC 3s01	10	3s 2	Gr+Sm
1	04c	HRC 3s01	10	3s 2	Lo
1	04c	HRC 3s01	10	3s 2	Lo+Al
24	04c	HRC 3s01	10	3s 2	Lo/Gr
1	04c	HRC 3s01+HRC 7e11	08	3s 2+7e 2	Gr+Mb
2	04c	HRC 3s01+HRC 7e04	08	3s 2+7e 4	Gr/Sm
1	04c	HRC 3s01+HRC 2s01	09	3s 2+2s 1	Al/Gr
1	04c	HRC 3s01+HRC 8e03	10	3s 2+8e 3	Al+Mm
4	04c	HRC 4s02	08	4s 1	Gr
4	04c	HRC 4s02	08	4s 1	Gr+Al
2	04c	HRC 4s02	09	4s 2	Al/Gr
3	04c	HRC 4s02	10	4s 2	Gr
2	04c	HRC 4s02	10	4s 2	Gr+Al
1	04c	HRC 4s02+HRC 7e04	08	4s 1+7e 4	Gr+Sm
2	04d	HRC 2w03	09	2w 2	Pt
3	04d	HRC 2w03	09	2w 2	Pt+Al
1	04d	HRC 2w03	10	2w 4	Pt+Al
1	04d	HRC 3w05	09	3w 2	Al+Pt
3	04d	HRC 3w05	09	3w 2	Pt
3	04d	HRC 3w05	09	3w 2	Pt+Al
2	04d	HRC 3w05	09	3w 2	Pt+Wb
8	04d	HRC 3w05+HRC 6s10	09	3w 2+6s 5	Pt+Wb
1	04d	HRC 4w05	09	4w 3	Pt
1	04d	HRC 4w05	09	4w 3	Pt+Wb
1	04d	HRC 4w05	09	4w 3	Pt/Wb
1	05a	HRC 2s03	10	2s 2	Al/Gr
11	05a	HRC 3s04	09	3s 4	Al
1	05a	HRC 3s04	09	3s 4	Al+Gr
4	05a	HRC 3s04	09	3s 4	Al/Gr
27	05a	HRC 3s04	09	3s 4	Lo
1	05a	HRC 3s04	09	3s 4	Lo/Us
1	05a	HRC 3s04	09	3s 4	Us
39	05a	HRC 3s04	10	2s 2	Al
2	05a	HRC 3s04	10	2s 2	Al+Lo
16	05a	HRC 3s04	10	2s 2	Al/Gr
2	05a	HRC 3s04	10	2s 2	Al/Gr+Lo
154	05a	HRC 3s04	10	2s 2	Lo
2	05a	HRC 3s04	10	2s 2	Lo+Al/Gr
4	05a	HRC 3s04	10	2s 2	Lo+Mo
2	05a	HRC 3s04	10	2s 2	Lo/Al
27	05a	HRC 3s04	10	2s 2	Lo/Gr

1	05a	HRC 3s04	10	2s 2	Lo/Sm+Gr
3	05a	HRC 3s04	10	2s 2	Lo/Wb
1	05a	HRC 3s04+HRC 1s01	09	3s 4+1s 1	Us+Al
2	05a	HRC 3s04+HRC 6e01	09	3s 4+6e 1	Lo/Us
1	05a	HRC 3s04+HRC 3e06	10	2s 2+3e 4	Lo
1	05a	HRC 3s04+HRC 6e22	10	2s 2+6e14	Lo/Sm
1	05a	HRC 3s04+HRC 7e04	10	2s 2+7e 3	Lo+Sm
23	05a	HRC 3e06	09	3e 3	Lo
2	05a	HRC 3e06	09	3e 3	Lo+Al
1	05a	HRC 3e06	09	3e 3	Lo/Us
1	05a	HRC 3e06	10	3e 4	(Mo)/Mm
11	05a	HRC 3e06	10	3e 4	Al
3	05a	HRC 3e06	10	3e 4	Al+Lo
1	05a	HRC 3e06	10	3e 4	Al+Sm
4	05a	HRC 3e06	10	3e 4	Al+Tp
2	05a	HRC 3e06	10	3e 4	Al+Us
51	05a	HRC 3e06	10	3e 4	Lo
2	05a	HRC 3e06	10	3e 4	Lo/Gr
1	05a	HRC 3e06	10	3e 4	Lo/Gr+Al
1	05a	HRC 3e06	10	3e 4	Lo/Gr/Sm
1	05a	HRC 3e06	10	3e 4	Lo/Sm
9	05a	HRC 3e06	10	3e 4	Mm
4	05a	HRC 3e06	10	3e 4	Mm+Al
7	05a	HRC 3e06	10	3e 4	Sm
2	05a	HRC 3e06	10	3e 4	Sm+Li
1	05a	HRC 3e06+HRC 2c02	09	3e 3+2c 1	Lo/Gr
2	05a	HRC 3e06+HRC 3s04	09	3e 3+3s 4	Lo+Al/Gr
2	05a	HRC 3e06+HRC 6e01	09	3e 3+6e 1	Lo/Us
2	05a	HRC 3e06+HRC 6e05	10	3e 4+6e 3	Mm
3	05a	HRC 3e06+HRC 6e22	10	3e 4+6e14	Lo/Sm
1	05a	HRC 3e06+HRC 8e03	10	3e 4+8e 3	Lo/Gr
10	05a	HRC 4e04	09	4e 2	Lo
6	05a	HRC 4e04	09	4e 2	Lo/Gw
1	05a	HRC 4e04	09	4e 2	Lo/Us
1	05a	HRC 4e04	10	4e 4	(Lo)/Sm+Al
1	05a	HRC 4e04	10	4e 4	(Lo)/Sm+Us
6	05a	HRC 4e04	10	4e 4	(Mo)/Mj
1	05a	HRC 4e04	10	4e 4	Al
1	05a	HRC 4e04	10	4e 4	Al+Gr
1	05a	HRC 4e04	10	4e 4	Al+Sm
29	05a	HRC 4e04	10	4e 4	Lo
1	05a	HRC 4e04	10	4e 4	Lo+Al
1	05a	HRC 4e04	10	4e 4	Lo/Al
2	05a	HRC 4e04	10	4e 4	Lo/Gr+Sm
4	05a	HRC 4e04	10	4e 4	Lo/Gr+Us
18	05a	HRC 4e04	10	4e 4	Lo/Sm
1	05a	HRC 4e04	10	4e 4	Lo/Sm+(Gr)
3	05a	HRC 4e04	10	4e 4	Lo/Sm+Gr

4	05a	HRC 4e04	10	4e 4	Lo/Us
3	05a	HRC 4e04	10	4e 4	Mj
39	05a	HRC 4e04	10	4e 4	Mm
4	05a	HRC 4e04	10	4e 4	Mm+Al
16	05a	HRC 4e04	10	4e 4	Sm
1	05a	HRC 4e04	10	4e 4	Sm+Al
2	05a	HRC 4e04+HRC 6e01	09	4e 2+6e 1	Lo/Us
1	05a	HRC 6e01	09	6e 1	(Lo)/Sm+Us
8	05a	HRC 6e01	09	6e 1	(Lo)/Us
8	05a	HRC 6e01	09	6e 1	Lo/Us
1	05a	HRC 6e01	09	6e 1	Sm
3	05a	HRC 6e01	09	6e 1	Us
6	05a	HRC 6e01	10	6e 2	(Lo)/Sm
1	05a	HRC 6e01	10	6e 2	(Lo+Mo)/Sm
1	05a	HRC 6e01	10	6e 2	Gr+Sm
2	05a	HRC 6e01	10	6e 2	Lo
1	05a	HRC 6e01	10	6e 2	Lo+Mo/Sm
2	05a	HRC 6e01	10	6e 2	Lo/Gr
62	05a	HRC 6e01	10	6e 2	Lo/Sm
1	05a	HRC 6e01	10	6e 2	Lo/Sm+(Gr)
11	05a	HRC 6e01	10	6e 2	Lo/Sm+Gr
11	05a	HRC 6e01	10	6e 2	Lo/Sm+Us
3	05a	HRC 6e01	10	6e 2	Lo/Us+Gr
1	05a	HRC 6e01	10	6e 2	Lo/Us+Sm
24	05a	HRC 6e01	10	6e 2	Sm
1	05a	HRC 6e01	10	6e 2	Sm+Gr
1	05a	HRC 6e01	10	6e 2	Sm+Mm
1	05a	HRC 6e01+HRC 3e06	09	6e 1+3e 3	Lo/Us
1	05a	HRC 6e01+HRC 3s04	09	6e 1+3s 4	Lo/Us
1	05a	HRC 6e01+HRC 4e04	09	6e 1+4e 2	(Lo)/Us
1	05a	HRC 6e01+HRC 4e04	09	6e 1+4e 2	Lo/Gw
2	05a	HRC 6e01+HRC 4e04	09	6e 1+4e 2	Lo/Us
1	05a	HRC 6e01+HRC 2s03	10	6e 2+2s 2	Lo/Sm+Gr
3	05b	HRC 1c02	10	1c 2	Al
2	05b	HRC 1c02	10	1c 2	Lo
2	05b	HRC 1c02	10	1c 2	Lo+Mo
18	05b	HRC 1c02	10	1c 2	Lo/Gr
1	05b	HRC 2c01	10	2c 1	(Mo)/Sm
1	05b	HRC 2c01	10	2c 1	Al
10	05b	HRC 2c01	10	2c 1	Lo
1	05b	HRC 2c01	10	2c 1	Lo+Al
2	05b	HRC 2c01	10	2c 1	Lo+Mo
15	05b	HRC 2c01	10	2c 1	Lo/Gr
1	05b	HRC 2c01	10	2c 1	Mo
4	05b	HRC 2c01	10	2c 1	Mo/La
1	05b	HRC 2c01	10	2c 1	Mo/Mm
1	05b	HRC 2c01	10	2c 1	Mo/Sm
3	05b	HRC 2c01+HRC 3s01	10	2c 1+3s 2	Al

9	05b	HRC 2c01+HRC 3s01	10	2c 1+3s 2	Al+Gr
4	05b	HRC 2c01+HRC 4e03	10	2c 1+4e 3	Lo
1	05b	HRC 2c01+HRC 8e03	10	2c 1+8e 3	Mo/Mm+La
2	05b	HRC 2e03	10	2e 2	Al
6	05b	HRC 2e03	10	2e 2	Lo
1	05b	HRC 2e03	10	2e 2	Lo+Al
6	05b	HRC 2e03	10	2e 2	Lo+Mo
10	05b	HRC 2e03	10	2e 2	Lo/Gr
3	05b	HRC 2e03	10	2e 2	Mo+Lo
1	05b	HRC 2e03+HRC 6e01	10	2e 2+6e 2	Lo/Sm
4	05b	HRC 3c02	10	3c 2	Al
18	05b	HRC 3c02	10	3c 2	Al+Gr
1	05b	HRC 3c02	10	3c 2	Al+Lo
5	05b	HRC 3c02	10	3c 2	Al/Gr
6	05b	HRC 3c02	10	3c 2	Lo
3	05b	HRC 3c02	10	3c 2	Lo+Al/Gr
1	05b	HRC 3c02	10	3c 2	Lo+Gr
11	05b	HRC 3c02	10	3c 2	Lo/Gr
1	05b	HRC 3c02	10	3c 2	Lo/Gw
1	05b	HRC 3c02	10	3c 2	Lo/Sm
1	05b	HRC 3e04	10	3e 3	Al+Lo
14	05b	HRC 3e04	10	3e 3	Lo
5	05b	HRC 3e04	10	3e 3	Lo+Mo
2	05b	HRC 3e04	10	3e 3	Lo+Mo/Gr
1	05b	HRC 3e04	10	3e 3	Lo/Al
7	05b	HRC 3e04	10	3e 3	Lo/Gr
1	05b	HRC 3e04	10	3e 3	Lo/Sm
1	05b	HRC 3e04	10	3e 3	Mo/Sm
1	05b	HRC 3e04	10	3e 3	Mo/Us
1	05b	HRC 4e03	10	4e 3	(Mo)/Us
3	05b	HRC 4e03	10	4e 3	Lo
5	05b	HRC 4e03	10	4e 3	Lo+Mo
8	05b	HRC 4e03	10	4e 3	Lo+Mo/Sm
2	05b	HRC 4e03	10	4e 3	Lo/Gr+Sm
1	05b	HRC 4e03	10	4e 3	Lo/Gr+Us
12	05b	HRC 4e03	10	4e 3	Lo/Sm
2	05b	HRC 4e03	10	4e 3	Mo+Lo
1	05b	HRC 4e03	10	4e 3	Mo/Sm
1	05b	HRC 4e03	10	4e 3	Mo/Us
19	05b	HRC 6c04	10	6c 2	(Lo)/Sm
2	05b	HRC 6c04	10	6c 2	(Lo)/Sm+Gr
1	05b	HRC 6c04	10	6c 2	Gw
4	05b	HRC 6c04	10	6c 2	Lo/Gw
1	05b	HRC 6c04	10	6c 2	Lo/Mm
2	05b	HRC 6c04	10	6c 2	Lo/Sm
1	05b	HRC 6c04	10	6c 2	Mo/Sm
29	05b	HRC 6c04	10	6c 2	Sm
2	05c	HRC 2c01	08	2c 1	Al

2	05c	HRC 2c01	08	2c 1	Lo
19	05c	HRC 2c01	08	2c 1	Lo/Gr
1	05c	HRC 3e05	08	3e 1	(Lo)/Gr
1	05c	HRC 3e05	08	3e 1	Lo
28	05c	HRC 3e05	08	3e 1	Lo/Gr
3	05c	HRC 3e05	08	3e 1	Lo/Gr+Us
2	05c	HRC 3e05	08	3e 1	Lo/Mj
8	05c	HRC 3e05	08	3e 1	Lo/Us
7	05c	HRC 3e05	08	3e 1	Lo/Us+Gr
1	05c	HRC 3e05+HRC 7e06	08	3s 1+7e 3	Al+Sm
2	05c	HRC 4e03	08	4e 1	(Lo)/Gr
1	05c	HRC 4e03	08	4e 1	(Lo)/Gr+Us
3	05c	HRC 4e03	08	4e 1	(Lo)/Sm
1	05c	HRC 4e03	08	4e 1	(Lo)/Sm+Mj
1	05c	HRC 4e03	08	4e 1	Lo
16	05c	HRC 4e03	08	4e 1	Lo/Gr
3	05c	HRC 4e03	08	4e 1	Lo/Gr+Us
2	05c	HRC 4e03	08	4e 1	Lo/Gr/Mj
3	05c	HRC 4e03	08	4e 1	Lo/Mj
6	05c	HRC 4e03	08	4e 1	Lo/Sm
19	05c	HRC 4e03	08	4e 1	Lo/Us
12	05c	HRC 4e03	08	4e 1	Lo/Us+Gr
2	05c	HRC 4e03	08	4e 1	Mb
2	05c	HRC 4e03	08	4e 1	Mj
1	05c	HRC 4e03+HRC 8e03	08	4e 1+8e 1	(Lo)/Mj
4	05c	HRC 6e02	08	6e 1	(Lo)/Gr
4	05c	HRC 6e02	08	6e 1	(Lo)/Gr+Sm
3	05c	HRC 6e02	08	6e 1	(Lo)/Gr+Us
7	05c	HRC 6e02	08	6e 1	(Lo)/Mj
11	05c	HRC 6e02	08	6e 1	(Lo)/Sm
1	05c	HRC 6e02	08	6e 1	(Lo)/Sm+Gr
1	05c	HRC 6e02	08	6e 1	(Lo)/Sm+Li
1	05c	HRC 6e02	08	6e 1	(Lo)/Sm+Mj
1	05c	HRC 6e02	08	6e 1	(Lo)/Us+Gr
1	05c	HRC 6e02	08	6e 1	Gr
1	05c	HRC 6e02	08	6e 1	Lo/Gr+Gw
2	05c	HRC 6e02	08	6e 1	Lo/Gr+Us
1	05c	HRC 6e02	08	6e 1	Lo/Mj
1	05c	HRC 6e02	08	6e 1	Lo/Mm+Gw
16	05c	HRC 6e02	08	6e 1	Lo/Sm
3	05c	HRC 6e02	08	6e 1	Lo/Sm+Us
13	05c	HRC 6e02	08	6e 1	Lo/Us
5	05c	HRC 6e02	08	6e 1	Lo/Us+Gr
1	05c	HRC 6e02	08	6e 1	Lo/Us+Sm
9	05c	HRC 6e02	08	6e 1	Mb
1	05c	HRC 6e02	08	6e 1	Mb+Mj
2	05c	HRC 6e02	08	6e 1	Mb+Sm
1	05c	HRC 6e02	08	6e 1	Mj

5	05c	HRC 6e02	08	6e 1	Sm
5	05c	HRC 6e02	08	6e 1	Sm+Mj
1	05c	HRC 6e15	08	6e 4	Sm+Li
3	05c	HRC 6s03	08	6s 1	(Lo)/Gr
1	05c	HRC 6s03	08	6s 1	Gr
1	05c	HRC 6s03	08	6s 1	Lo/Gr
10	05d	HRC 1c01	09	1c 1	Lo
1	05d	HRC 1c01	09	1c 1	Lo/Gr
1	05d	HRC 1c01	09	1c 1	Lo/Us
1	05d	HRC 1c01+HRC 6e01	09	1c 1+6e 1	Lo
2	05d	HRC 1c01+HRC 6e01	09	1c 1+6e 1	Lo/Us
16	05d	HRC 2c02	09	2c 1	Lo
4	05d	HRC 2c02+HRC 6e01	09	2c 1+6e 1	Lo/Us
4	05d	HRC 2e01	09	2e 1	Lo
2	05d	HRC 2e01	09	2e 1	Lo/Us
1	05d	HRC 2e01+HRC 6e01	09	2e 1+6e 1	Lo/Us
3	05d	HRC 3e02	09	3e 1	(Lo)/Us
3	05d	HRC 3e02	09	3e 1	Lo/Us
1	05d	HRC 3e02+HRC 2c02	09	3e 2+2c 1	Lo
1	06a	HRC 4e06	10	4e 5	Mo
2	06a	HRC 4e06	10	4e 5	Mo/Al
3	06a	HRC 4e06	10	4e 5	Mo/La
5	06a	HRC 4e06	10	4e 5	Mo/Mb
5	06a	HRC 4e06	10	4e 5	Mo/Mm
12	06a	HRC 4e06	10	4e 5	Mo/Sm
2	06a	HRC 4e06	10	4e 5	Mo/Vo
2	06a	HRC 4e06+HRC 6e29	10	4e 5+6e17	Mo/Sm
1	06a	HRC 4e06+HRC 6s02	10	4e 5+6s 2	Mo/Mm
13	06a	HRC 5s01	10	5s 2	Mo/La
1	06a	HRC 5s01	10	5s 2	Mo/Mb
1	06a	HRC 5s01	10	5s 2	Mo/Vo
1	06a	HRC 6e11	10	6e 9	Mo/Sm
2	06a	HRC 6e11	10	6e 9	Mo/Vo
2	06a	HRC 6s02	10	6s 2	(Mo)/Mb
2	06a	HRC 6s02	10	6s 2	Mo/Gw
12	06a	HRC 6s02	10	6s 2	Mo/Mb
10	06a	HRC 6s02	10	6s 2	Mo/Sm
1	06a	HRC 6s02	10	6s 2	Mo/Sm+Tp
4	06a	HRC 6s02	10	6s 2	Mo/Vo
1	06a	HRC 6s12	10	6s 8	Kt/Mo/Vo
1	06a	HRC 6s12	10	6s 8	Mo/La
17	06a	HRC 6s12	10	6s 8	Mo/Vo
1	06a	HRC 6s12+HRC 8e09	10	6s 8+8s 1	Kt/Mo/Vo
7	06a	HRC 7s03	10	7s 1	Kt/Mo/Vo
2	06a	HRC 7s03	10	7s 1	Mo/Vo
1	06b	HRC 3e09	04	3e 6	Kt/Mo
1	06b	HRC 3e09	04	3e 6	Kt/Mo+Tp
26	06b	HRC 3e11	10	3e 7	Kt/Mo

1	06b	HRC 3e11	10	3e 7	Kt/Mo+Tp
2	06b	HRC 3e11+HRC 6w01	10	3e 7+6w 1	Kt/Mo+Tp
13	06b	HRC 3s03	10	3s 4	Kt/Mo
105	06b	HRC 4e11	10	4e 9	Kt/Mo
2	06b	HRC 4e11	10	4e 9	Kt/Mo+Tp
3	06b	HRC 4e11	10	4e 9	Kt/Mo/Vo
2	06b	HRC 4e11+HRC 6s05	10	4e 9+6s 5	Kt/Mo/Vo
9	06b	HRC 4e13	04	4e 6	Kt/Mo
4	06b	HRC 4e14	04	4e 8	Kt/Mo
1	06b	HRC 4e17	04	4e 9	Kt/Mo
3	06b	HRC 4e22	04	4e16	Kt/Mo
2	06b	HRC 6e18	04	6e 9	Kt/Mo/Gw
5	06b	HRC 6e18	04	6e 9	Kt/Mo/Vo
1	06b	HRC 6e18	04	6e 9	Mo/Sm
1	06b	HRC 6e30	10	6e18	Kt/Mo
26	06b	HRC 6e30	10	6e18	Kt/Mo/Gw
11	06b	HRC 6e30	10	6e18	Kt/Mo/La
2	06b	HRC 6e30	10	6e18	Kt/Mo/Mm
20	06b	HRC 6e30	10	6e18	Kt/Mo/Sm
56	06b	HRC 6e30	10	6e18	Kt/Mo/Vo
1	06b	HRC 6e30	10	6e18	Kt/Mo/Vo+Tp
1	06b	HRC 6e30+HRC 4e11	10	6e18+4e 9	Kt/Mo/Sm
1	06b	HRC 6e30+HRC 4e11	10	6e18+4e 9	Kt/Mo/Vo
2	06b	HRC 6s05	04	6s 2	Kt/Mo/Gw
1	06b	HRC 6s05	04	6s 2	Kt/Mo/Sm
22	06b	HRC 6s05	04	6s 2	Kt/Mo/Vo
5	06b	HRC 6s05	10	6s 5	Kt/Mo
2	06b	HRC 6s05	10	6s 5	Kt/Mo+Tp
13	06b	HRC 6s05	10	6s 5	Kt/Mo/Gw
6	06b	HRC 6s05	10	6s 5	Kt/Mo/La
15	06b	HRC 6s05	10	6s 5	Kt/Mo/Sm
80	06b	HRC 6s05	10	6s 5	Kt/Mo/Vo
1	06b	HRC 6s05	10	6s 5	Kt/Mo/Vo+Sm
1	06b	HRC 6s05	10	6s 5	Kt/Mo/Vo+Tp
1	06b	HRC 7e12	04	7e 6	Kt/Mo/Gw
8	06b	HRC 7e12	04	7e 6	Kt/Mo/Vo
1	06b	HRC 7e12	04	7e 6	Mo/Gw
1	06b	HRC 7e12	04	7e 6	Mo/Mm
1	06b	HRC 7e12	10	7e 8	(Kt)/Mo/Vo
1	06b	HRC 7e12	10	7e 8	(Mo)/La
1	06b	HRC 7e12	10	7e 8	Gw
15	06b	HRC 7e12	10	7e 8	Kt/Mo/Gw
1	06b	HRC 7e12	10	7e 8	Kt/Mo/La
4	06b	HRC 7e12	10	7e 8	Kt/Mo/Sm
23	06b	HRC 7e12	10	7e 8	Kt/Mo/Vo
2	06b	HRC 7e12	10	7e 8	La
3	06b	HRC 7e12	10	7e 8	Mo/Gw
1	06b	HRC 7e12	10	7e 8	Mo/Vo

1	06b	HRC 7e12	10	7e 8	Ng/Kt/Mo
11	07	HRC 2s06	10	2s 5	Tp
9	07	HRC 3e12	10	3e 8	Tp
1	07	HRC 3e12+HRC 8e02	10	3e 8+8e 2	Tp
1	07	HRC 3e12+HRC 8e02	10	3e 8+8e 2	Tp/Mm
32	07	HRC 3s06	10	3s 6	Tp
1	07	HRC 3s06	10	3s 6	Tp+Al
1	07	HRC 3s06+HRC 4w01	10	3s 6+4w 1	(Tp)/Al
2	07	HRC 3s06+HRC 6e39	10	3s 6+6e26	Tp
3	07	HRC 3s06+HRC 7e31	10	3s 6+7e19	Tp
7	07	HRC 3s06+HRC 8e02	10	3s 6+8e 2	Tp
2	07	HRC 4e18	04	4e13	Kt/Mo
2	07	HRC 4e18	04	4e13	Kt/Mo+Tp
1	07	HRC 4e18	04	4e13	Kt/Mo/Vo
1	07	HRC 4e18	04	4e13	Tp
2	07	HRC 4e18	04	4e13	Tp+Kt/Mo
21	07	HRC 4e18	10	4e11	Kt/Mo+Tp
7	07	HRC 4e18	10	4e11	Tp+Kt/Mo
3	07	HRC 4e18	10	4e11	Tp+Mo/Al
1	07	HRC 4e18	10	4e11	Tp+Mo/La
3	07	HRC 4e18	10	4e11	Tp+Mo/Mb
1	07	HRC 4e18	10	4e11	Tp+Mo/Sm
1	07	HRC 4e20	10	4e13	(Ng)/Tp
32	07	HRC 4e20	10	4e13	Tp
12	07	HRC 4e21	10	4e14	Tp
1	07	HRC 4e21+HRC 6w01	10	4e14+6w 1	Tp
1	07	HRC 4e23	04	4e18	Tp
1	07	HRC 4e23+HRC 6w01	04	4e18+6w 2	Tp
1	07	HRC 4s03	10	4s 3	(Ng)/Tp
1	07	HRC 4s03	10	4s 3	Ng/Tp
1	07	HRC 4s03	10	4s 3	Ng/Tp/Mo
1	07	HRC 4s03	10	4s 3	Tp
2	07	HRC 4w04	07	4w 2	Tp+Pt
2	07	HRC 4w04	10	4w 4	Al
1	07	HRC 4w04	10	4w 4	Al+Mo
1	07	HRC 4w04	10	4w 4	Kt/Mo+Pt
2	07	HRC 4w04	10	4w 4	Mo/Al
1	07	HRC 4w04	10	4w 4	Mo/La
3	07	HRC 4w04	10	4w 4	Pt+Kt
2	07	HRC 4w04	10	4w 4	Tp+Pt
1	07	HRC 6e39	04	6e24	Kt/Mo+Tp
2	07	HRC 6e39	04	6e24	Tp
1	07	HRC 6e39	04	6e24	Tp+Kt/Mo
12	07	HRC 6e39	10	6e26	Tp
5	07	HRC 6e39	10	6e26	Tp+Kt/Mo
1	07	HRC 6e39	10	6e26	Tp/Vo
1	07	HRC 6w01	10	6w 1	Al
2	07	HRC 6w01	10	6w 1	Kt/Mo

1	07	HRC 6w01	10	6w 1	Kt/Mo+Pt
1	07	HRC 6w01	10	6w 1	Mo/La
1	07	HRC 6w01	10	6w 1	Mo/Sm
3	07	HRC 6w01	10	6w 1	Ng/Mo
2	07	HRC 6w01	10	6w 1	Tp
1	07	HRC 6w01	10	6w 1	Tp+Kt/Mo
1	07	HRC 6w01+HRC 4e21	10	6w 1+4e14	Tp
1	07	HRC 7e31	04	7e12	Tp
11	07	HRC 7e31	10	7e19	Tp
2	07	HRC 7e31	10	7e19	Tp+Kt+Mo
1	07	HRC 7e31	10	7e19	Tp+Mb
1	07	HRC 7e39	10	7e26	Ng+Tp
1	07	HRC 7e39	10	7e26	Ng/Kt
4	07	HRC 7e39	10	7e26	Ng/Kt+Tp
1	07	HRC 7e39	10	7e26	Ng/Kt/Mo
3	07	HRC 7e39	10	7e26	Ng/Mo
2	07	HRC 7e39	10	7e26	Ng/Mo/Gw
1	07	HRC 8e02	10	8e 2	Kt/Mo+Tp
1	07	HRC 8e02	10	8e 2	Sm
4	07	HRC 8e02	10	8e 2	Sm+Us
4	07	HRC 8e02	10	8e 2	Tp
3	07	HRC 8e02	10	8e 2	Tp+Ng/Kt
4	07	HRC 8e02	10	8e 2	Tp+Sm
1	07	HRC 8w01	10	8w 1	Mo+Pt
1	07	HRC 8w01	10	8w 1	Pt/Tp
1	07	HRC 8w01	10	8w 1	Tp
1	08a	HRC 3c04	10	3c 3	(Kt)/Mo/Sm
1	08a	HRC 3c04	10	3c 3	(Ng)/Mo
3	08a	HRC 3c04	10	3c 3	Kt/Mo
3	08a	HRC 3c04	10	3c 3	Mo
3	08a	HRC 3c04	10	3c 3	Mo/Sm
2	08a	HRC 3c04	10	3c 3	Ng/Tp
5	08a	HRC 4c03	10	4c 2	(Kt)/Mo
1	08a	HRC 4c03	10	4c 2	(Kt)/Mo/Mj
10	08a	HRC 4c03	10	4c 2	(Kt)/Mo/Sm
12	08a	HRC 4c03	10	4c 2	Kt/Mo
11	08a	HRC 4c03	10	4c 2	Kt/Mo/Sm
3	08a	HRC 4c03	10	4c 2	Mo/Sm
3	08a	HRC 4c03	10	4c 2	Mo/Vo
1	08a	HRC 4c03	10	4c 2	Ng/Al
10	08a	HRC 4c03	10	4c 2	Ng/Mo
1	08a	HRC 4c03	10	4c 2	Ng/Mo+Al
1	08a	HRC 4c03+HRC 6e40	10	4c 2+6e27	Ng/Mo/Sm
2	08a	HRC 4e19	07	4e 4	Kt/Mo
3	08a	HRC 4e19	07	4e 4	Tp
8	08a	HRC 4e19	10	4e12	(Kt)/Mo
22	08a	HRC 4e19	10	4e12	(Kt)/Mo/Sm
4	08a	HRC 4e19	10	4e12	Kt/Mo

1	08a	HRC 4e19	10	4e12	Kt/Mo+Pt
13	08a	HRC 4e19	10	4e12	Kt/Mo/Sm
6	08a	HRC 4e19	10	4e12	Mo/Sm
1	08a	HRC 4e19	10	4e12	Mo/Sm+Mj
2	08a	HRC 4e19	10	4e12	Ng/Mo
4	08a	HRC 4e19	10	4e12	Tp
1	08a	HRC 4e19+HRC 3c04	10	4e12+3c 3	(Kt)/Mo/Sm
1	08a	HRC 4e19+HRC 6c05	10	4e12+6c 3	(Kt)/Mo/Sm
1	08a	HRC 4e19+HRC 6e40	10	4e12+6e27	(Kt)/Mo/Sm
1	08a	HRC 4e19+HRC 6e40	10	4e12+6e27	(Mo)/Sm
4	08a	HRC 6c05	07	6c 2	(Kt)/Mo/Sm
2	08a	HRC 6c05	07	6c 2	Kt/Mo/Sm
6	08a	HRC 6c05	10	6c 3	(Kt)/Mo
2	08a	HRC 6c05	10	6c 3	(Kt)/Mo/Gw
1	08a	HRC 6c05	10	6c 3	(Kt)/Mo/Gw+Tp
49	08a	HRC 6c05	10	6c 3	(Kt)/Mo/Sm
1	08a	HRC 6c05	10	6c 3	(Kt)/Sm
1	08a	HRC 6c05	10	6c 3	(Mo)/Sm
4	08a	HRC 6c05	10	6c 3	(Ng)/Mo/Sm
4	08a	HRC 6c05	10	6c 3	Kt/Mo
7	08a	HRC 6c05	10	6c 3	Kt/Mo/Sm
23	08a	HRC 6c05	10	6c 3	Mo/Sm
18	08a	HRC 6c05	10	6c 3	Ng/Mo
1	08a	HRC 6c05	10	6c 3	Ng/Mo/La
5	08a	HRC 6c05	10	6c 3	Ng/Mo/Sm
2	08a	HRC 6c05+HRC 4e19	10	6c 3+4e12	Mo/Sm
1	08a	HRC 6c05+HRC 7e21	10	6c 3+7e13	Mo/Sm
1	08a	HRC 6e40	07	6e16	(Kt)/Mo
1	08a	HRC 6e40	07	6e16	Kt/Mo/Sm
1	08a	HRC 6e40	07	6e16	Mo/Sm
2	08a	HRC 6e40	10	6e27	(Kt)/Mo
1	08a	HRC 6e40	10	6e27	(Kt)/Mo/Gw
24	08a	HRC 6e40	10	6e27	(Kt)/Mo/Sm
23	08a	HRC 6e40	10	6e27	(Mo)/Sm
3	08a	HRC 6e40	10	6e27	(Ng)/Mo/Sm
1	08a	HRC 6e40	10	6e27	(Ng)/Mo/Vo
2	08a	HRC 6e40	10	6e27	(Ng)/Sm
5	08a	HRC 6e40	10	6e27	Kt/Mo/Gw
3	08a	HRC 6e40	10	6e27	Kt/Mo/Sm
3	08a	HRC 6e40	10	6e27	Mo/Gw
23	08a	HRC 6e40	10	6e27	Mo/Sm
2	08a	HRC 6e40	10	6e27	Mo/Sm+Mm
2	08a	HRC 6e40	10	6e27	Mo/Vo
1	08a	HRC 6e40	10	6e27	Ng/Mo
1	08a	HRC 6e40	10	6e27	Ng/Mo+Tp
7	08a	HRC 6e40	10	6e27	Ng/Mo/Sm
3	08a	HRC 6e40+HRC 4c03	10	6e27+4c 2	(Kt)/Mo/Sm
3	08a	HRC 6e40+HRC 4c03	10	6e27+4c 2	Ng/Mo/Sm

1	08a	HRC 6e40+HRC 4e19	10	6e27+4e12	Kt/Mo/Gw
1	08a	HRC 6e40+HRC 4e19	10	6e27+4e12	Mo/Sm
2	08a	HRC 7e33	07	7e12	(Kt)/Mo/Sm
1	08a	HRC 7e33	07	7e12	(Mo)/Sm
1	08a	HRC 7e33	07	7e12	Kt/Mo/Sm+Li
22	08a	HRC 7e34	10	7e21	(Mo)/Sm
2	08a	HRC 7e34	10	7e21	(Mo)/Sm+Gw
3	08a	HRC 7e34	10	7e21	(Ng)/Mo/Sm
1	08a	HRC 7e34	10	7e21	Mo/La
1	08a	HRC 7e34	10	7e21	Mo/Li+Sm
9	08a	HRC 7e34	10	7e21	Mo/Sm
1	08a	HRC 7e34	10	7e21	Mo/Sm+Gw
2	08a	HRC 7e34	10	7e21	Sm
1	08a	HRC 7e34	10	7e21	Sm+Li
2	08a	HRC 7e35	07	7e18	Mo/Gw
2	08a	HRC 7e35	10	7e22	(Kt)/Mo/Gw
1	08a	HRC 7e35	10	7e22	(Mo)/Gw
1	08a	HRC 7e35	10	7e22	(Mo)/Gw+Sm
15	08a	HRC 7e35	10	7e22	(Ng)/Mo/Gw
3	08a	HRC 7e35	10	7e22	Kt/Mo/Gw
6	08a	HRC 7e35	10	7e22	Mo/Gw
8	08a	HRC 7e35	10	7e22	Ng/Mo/Gw
30	08a	HRC 7e36	10	7e23	(Mo)/Sm
4	08a	HRC 7e36	10	7e23	Mo/Sm
1	08a	HRC 7e36	10	7e23	Sm
1	08a	HRC 7e37	07	7e17	(Kt)/Mo/Sm
2	08a	HRC 7e37	07	7e17	Kt/Mo/Gw
1	08a	HRC 7e37	07	7e17	Mo/Gw
19	08b	HRC 4c04	10	4c 4	Kt/Mo
4	08b	HRC 4c04	10	4c 4	Kt/Mo+Tp
1	08b	HRC 4c04	10	4c 4	Kt/Mo/Tp
1	08b	HRC 4c04	10	4c 4	Mo/La
2	08b	HRC 4c04+HRC 6w01	10	4c 4+6w 1	Kt/Mo+Tp
1	08b	HRC 6c06	04	6c 1	Kt/Mo/Gw
4	08b	HRC 6c06	04	6c 1	Kt/Mo/Vo
1	08b	HRC 6c06+HRC 7e12	04	6c 1+7e 6	Kt/Mo/Vo
37	08b	HRC 6c07	10	6c 4	Kt/Mo
1	08b	HRC 6c07	10	6c 4	Kt/Mo+Tp
7	08b	HRC 6c07	10	6c 4	Kt/Mo/Gw
1	08b	HRC 6c07	10	6c 4	Kt/Mo/La
1	08b	HRC 6c07	10	6c 4	Kt/Mo/Sm
16	08b	HRC 6c07	10	6c 4	Kt/Mo/Vo
1	08b	HRC 6c07	10	6c 4	Mo
2	08b	HRC 6c07	10	6c 4	Mo/La
5	08b	HRC 6c07	10	6c 4	Mo/Vo
7	08b	HRC 6c07+HRC 6e39	10	6c 4+6e26	Kt/Mo+Tp
2	08b	HRC 6c07+HRC 6w01	10	6c 4+6w 1	Kt/Mo+Tp
1	08b	HRC 6c07+HRC 7e12	10	6c 4+7e 8	Kt/Mo/Vo

1	08b	HRC 7c01	04	7c 1	Kt/Mo
2	08b	HRC 7c01	04	7c 1	Kt/Mo/Vo
1	08b	HRC 7c01	10	7c 1	(Kt)/Mo
7	08b	HRC 7c01	10	7c 1	(Kt)/Mo/Sm
1	08b	HRC 7c01	10	7c 1	(Ng)/Mo/La
1	08b	HRC 7c01	10	7c 1	Gw
7	08b	HRC 7c01	10	7c 1	Kt/Mo
2	08b	HRC 7c01	10	7c 1	Kt/Mo+Tp
6	08b	HRC 7c01	10	7c 1	Kt/Mo/Gw
6	08b	HRC 7c01	10	7c 1	Kt/Mo/Vo
3	08b	HRC 7c01	10	7c 1	Mo/La
1	08b	HRC 7c01	10	7c 1	Mo/La/Vo
1	08b	HRC 7c01	10	7c 1	Mo/Sm
5	08b	HRC 7c01	10	7c 1	Mo/Vo
1	08b	HRC 7c01	10	7c 1	Ng/Kt/Mo
9	08b	HRC 7c01	10	7c 1	Ng/Mo
1	08b	HRC 7c01+ HRC 8w01	10	7c 1+8w 1	Kt/Mo
1	08b	HRC 7e37	10	7e24	(Kt)/Mo
1	08b	HRC 7e37	10	7e24	(Kt)/Mo/Gw
6	08b	HRC 7e37	10	7e24	(Kt)/Mo/Sm
1	08b	HRC 7e37	10	7e24	(Ng)/Mo
1	08b	HRC 7e37	10	7e24	Kt/Mo
1	08b	HRC 7e37	10	7e24	Kt/Mo+Tp
6	08b	HRC 7e37	10	7e24	Kt/Mo/Gw
1	08b	HRC 7e37	10	7e24	Kt/Mo/Sm+Li
2	08b	HRC 7e37	10	7e24	Mo/Gw
14	08b	HRC 7e37	10	7e24	Ng/Mo
4	08b	HRC 7e37	10	7e24	Ng/Mo/Gw
1	08b	HRC 7e37	10	7e24	(Mo)/Sm
1	08b	HRC 7e38	04	7e15	Ng/Kt/Mo
1	08b	HRC 7e38	10	7e25	Ng/Kt/Mo
1	08b	HRC 7e38	10	7e25	Ng/La
4	08b	HRC 7e38	10	7e25	Ng/Mo
1	08b	HRC 7e38	10	7e25	Ng/Mo/Gw
4	08b	HRC 7e38	10	7e25	Ng/Mo/La
1	08b	HRC 7e38	10	7e25	Ng/Vo
1	08b	HRC 8e12	04	8e 5	Ng/La
2	08b	HRC 8e12	04	8e 5	Ng/Mo
2	08b	HRC 8e12	04	8e 5	Ng/Vo
1	08b	HRC 8e12	10	8e10	(Ng)/Mo
1	08b	HRC 8e12	10	8e10	Ng+Tp
1	08b	HRC 8e12	10	8e10	Ng/La
10	08b	HRC 8e12	10	8e10	Ng/Mo
1	08b	HRC 8e12	10	8e10	Ng/Mo/La
2	08b	HRC 8e12	10	8e10	Ng/Mo/Vo
2	08b	HRC 8e12	10	8e10	Ng/Vo
1	08b	HRC 8e12	10	8e10	Tp+Ng/Kt
1	09a	HRC 3e08	08	3e 3	(Lo)/Mj

3	09a	HRC 3e08	08	3e 3	(Lo)/Us
4	09a	HRC 3e08	08	3e 3	Al
2	09a	HRC 3e08	08	3e 3	Mb+Al
8	09a	HRC 3e08	08	3e 3	Mj
1	09a	HRC 3e08	08	3e 3	Sm
4	09a	HRC 3s05	08	3s 3	(Lo)/Gr
1	09a	HRC 3s05	08	3s 3	(Lo)/Sm
9	09a	HRC 3s05	08	3s 3	Al
2	09a	HRC 3s05	08	3s 3	Al/Gr
1	09a	HRC 3s05	08	3s 3	Al/Gr+Sm
8	09a	HRC 3s05	08	3s 3	Lo/Gr
2	09a	HRC 3s05	08	3s 3	Mj
1	09a	HRC 3s05+HRC 7e11	08	3s 3+7e 2	Al/Gr+Mj
3	09a	HRC 4e09	08	4e 3	(Lo)/Sm+Us
3	09a	HRC 4e09	08	4e 3	(Lo)/Us
2	09a	HRC 4e09	08	4e 3	Al
1	09a	HRC 4e09	08	4e 3	Al+Sm
8	09a	HRC 4e09	08	4e 3	Mb
1	09a	HRC 4e09	08	4e 3	Me+Sb
22	09a	HRC 4e09	08	4e 3	Mj
3	09a	HRC 4e09	08	4e 3	Mj+Mb
1	09a	HRC 4e09	08	4e 3	Mj+Me
1	09a	HRC 4e09	08	4e 3	Sb
13	09a	HRC 4e09	08	4e 3	Sm
1	09a	HRC 4e09	08	4e 3	Sm+Ar
3	09a	HRC 6e03	08	6e 2	(Lo)/Mj
5	09a	HRC 6e03	08	6e 2	(Lo)/Mj+Sm
1	09a	HRC 6e03	08	6e 2	(Lo)/Mm+Sm
2	09a	HRC 6e03	08	6e 2	(Lo)/Sm+Us
6	09a	HRC 6e03	08	6e 2	(Lo)/Us
5	09a	HRC 6e03	08	6e 2	(Lo)/Us+Gr
4	09a	HRC 6e03	08	6e 2	Lo/Us
2	09a	HRC 6e03	08	6e 2	Lo/Us+Gr
20	09a	HRC 6e03	08	6e 2	Mb
1	09a	HRC 6e03	08	6e 2	Mb+Mj
58	09a	HRC 6e03	08	6e 2	Mj
1	09a	HRC 6e03	08	6e 2	Mj+Li
2	09a	HRC 6e03	08	6e 2	Mj+Mb
2	09a	HRC 6e03	08	6e 2	Mj+Sm
10	09a	HRC 6e03	08	6e 2	Mm
1	09a	HRC 6e03	08	6e 2	Sm
1	09a	HRC 6e03	08	6e 2	Sm+Li
1	09a	HRC 6e03	08	6e 2	Sm+Mm
2	09a	HRC 6e04	08	6e 3	(Lo)/Mj
3	09a	HRC 6e04	08	6e 3	(Lo)/Mj+Sm
1	09a	HRC 6e04	08	6e 3	(Lo)/Mj+Us
1	09a	HRC 6e04	08	6e 3	(Lo)/Mm
2	09a	HRC 6e04	08	6e 3	(Lo)/Sm

1	09a	HRC 6e04	08	6e 3	(Lo)/Us+Gr
1	09a	HRC 6e04	08	6e 3	Lo/Gr+Us
1	09a	HRC 6e04	08	6e 3	Lo/Us+Gr
2	09a	HRC 6e04	08	6e 3	Mb
2	09a	HRC 6e04	08	6e 3	Mb+Mj
18	09a	HRC 6e04	08	6e 3	Mj
2	09a	HRC 6e04	08	6e 3	Mj+Mb
1	09a	HRC 6e04	08	6e 3	Mj+Sm
3	09a	HRC 6e04	08	6e 3	Mm
1	09a	HRC 6e04	08	6e 3	Mm+(Li)
5	09a	HRC 6e04	08	6e 3	Sm
1	09a	HRC 6e04	08	6e 3	Sm+(Li)
1	09a	HRC 6e05	08	6e 7	(Lo)/Mj+Sm
3	09a	HRC 6e05	08	6e 7	Gr+Us
22	09a	HRC 6e05	08	6e 7	Mb
1	09a	HRC 6e05	08	6e 7	Mb+Gr
7	09a	HRC 6e05	08	6e 7	Mb+Mj
91	09a	HRC 6e05	08	6e 7	Mj
2	09a	HRC 6e05	08	6e 7	Mj+Li
6	09a	HRC 6e05	08	6e 7	Mj+Mb
1	09a	HRC 6e05	08	6e 7	Mj+Mm
15	09a	HRC 6e05	08	6e 7	Mj+Sm
1	09a	HRC 6e05	08	6e 7	Mj+Sm+Li
8	09a	HRC 6e05	08	6e 7	Mm
4	09a	HRC 6e05	08	6e 7	Mm+Sm
2	09a	HRC 6e05	08	6e 7	Sm+Gw
4	09a	HRC 6e05	08	6e 7	Sm+Mj
3	09a	HRC 6e05	10	6e 3	(Mo)/Mb
25	09a	HRC 6e05	10	6e 3	(Mo)/Mj
1	09a	HRC 6e05	10	6e 3	(Mo)/Mj+Mb
6	09a	HRC 6e05	10	6e 3	(Mo)/Mj+Sm
11	09a	HRC 6e05	10	6e 3	(Mo)/Mm
1	09a	HRC 6e05	10	6e 3	(Mo)/Mm+Mj
4	09a	HRC 6e05	10	6e 3	(Mo)/Mm+Sm
1	09a	HRC 6e05	10	6e 3	(Mo)/Sm+Mj
4	09a	HRC 6e05	10	6e 3	Al
27	09a	HRC 6e05	10	6e 3	Mj
2	09a	HRC 6e05	10	6e 3	Mj+Mb
5	09a	HRC 6e05	10	6e 3	Mj+Sm
62	09a	HRC 6e05	10	6e 3	Mm
1	09a	HRC 6e05	10	6e 3	Mm+Al
9	09a	HRC 6e05	10	6e 3	Mm+Sm
1	09a	HRC 6e05	10	6e 3	Mo/Gw
1	09a	HRC 6e05	10	6e 3	Mo/La
100	09a	HRC 6e05	10	6e 3	Mo/Mb
13	09a	HRC 6e05	10	6e 3	Mo/Mj
5	09a	HRC 6e05	10	6e 3	Mo/Mj+Sm
19	09a	HRC 6e05	10	6e 3	Mo/Mm

11	09a	HRC 6e05	10	6e 3	Mo/Mm+Sm
1	09a	HRC 6e05	10	6e 3	Sm+Mj
1	09a	HRC 6e05+HRC 3c05	10	6e 3+3c 4	Mo/Mj
3	09a	HRC 6e05+HRC 4e04	10	6e 3+4e 4	Mm
2	09a	HRC 6e05+HRC 4e07	10	6e 3+4e 6	(Mo)/Mj+Sm
4	09a	HRC 6e06	08	6e 8	Mb
15	09a	HRC 6e06	08	6e 8	Mj
1	09a	HRC 6e06	08	6e 8	Mj+Li
2	09a	HRC 6e06	08	6e 8	Mj+Mb
3	09a	HRC 6e06	08	6e 8	Mj+Sm
2	09a	HRC 6e06	08	6e 8	Mm
1	09a	HRC 6e06	08	6e 8	Mm+Mb
1	09a	HRC 6e06	08	6e 8	Sm
1	09a	HRC 6e06	10	6e 4	(Lo)/Mm
1	09a	HRC 6e06	10	6e 4	(Lo)/Mm+Sm
1	09a	HRC 6e06	10	6e 4	(Mo)/Mj
2	09a	HRC 6e06	10	6e 4	(Mo)/Mm
33	09a	HRC 6e06	10	6e 4	Mj
1	09a	HRC 6e06	10	6e 4	Mj+Sm
82	09a	HRC 6e06	10	6e 4	Mm
4	09a	HRC 6e06	10	6e 4	Mm+Sm
4	09a	HRC 6e06	10	6e 4	Mo/Mj
2	09a	HRC 6e06	10	6e 4	Mo/Mm
1	09a	HRC 6e06	10	6e 4	Sm
2	09a	HRC 6e06	10	6e 4	Sm+Mm
1	09a	HRC 6e06+HRC 4e04	10	6e 4+4e 4	(Mo)/Mm
1	09a	HRC 6e06+HRC 4e04	10	6e 4+4e 4	Mm
1	09a	HRC 6e20	02	6e 9	(Mo)/Mb
1	09a	HRC 6e20	02	6e 9	(Mo)/Mj+Sm
1	09a	HRC 6e20	02	6e 9	Kt/Mo/Mj
3	09a	HRC 6e20	02	6e 9	Mo/Mj
6	09a	HRC 7e01	08	7e 1	Mb
1	09a	HRC 7e01	08	7e 1	Mb+Gr
2	09a	HRC 7e01	08	7e 1	Mb+Mj
39	09a	HRC 7e01	08	7e 1	Mj
4	09a	HRC 7e01	08	7e 1	Mj+Mb
2	09a	HRC 7e01	10	7e 1	(Mo)/Mj
6	09a	HRC 7e01	10	7e 1	(Mo)/Mj+Sm
7	09a	HRC 7e01	10	7e 1	Mb
14	09a	HRC 7e01	10	7e 1	Mj
1	09a	HRC 7e01	10	7e 1	Mj+Sb
11	09a	HRC 7e01	10	7e 1	Mj+Sm
33	09a	HRC 7e01	10	7e 1	Mm
2	09a	HRC 7e01	10	7e 1	Mm+Mj
21	09a	HRC 7e01	10	7e 1	Mm+Sm
1	09a	HRC 7e01	10	7e 1	Mo/Mb
1	09a	HRC 7e01	10	7e 1	Mo/Mj
1	09a	HRC 7e01	10	7e 1	Sm

1	09a	HRC 7e01+HRC 7e20	08	7e 1+7e 8	Mj
1	09a	HRC 7e01+HRC 8e03	10	7e 1+8e 3	Mm+Sm
32	09a	HRC 7e03	10	7e 2	Mj
1	09a	HRC 7e03	10	7e 2	Mj+Sm
47	09a	HRC 7e03	10	7e 2	Mm
11	09a	HRC 7e03	10	7e 2	Mm+Sm
1	09a	HRC 7e03	10	7e 2	Sm
2	09a	HRC 7e11	08	7e 2	Gr
36	09a	HRC 7e11	08	7e 2	Mj
3	09a	HRC 7e11	08	7e 2	Mj+Li
2	09a	HRC 7e11	08	7e 2	Mj+Sm
6	09a	HRC 7e11	08	7e 2	Mm
2	09a	HRC 7e11	08	7e 2	Mm+Sm
15	09a	HRC 7e11	08	7e 2	Sm
1	09a	HRC 7e11	08	7e 2	Sm+Gr
2	09a	HRC 7e11	08	7e 2	Sm+Li
5	09a	HRC 7e11	08	7e 2	Sm+Mj
4	09a	HRC 7e11	08	7e 2	Sm+Mm
1	09a	HRC 7e11	08	7e 2	Us+Gr
1	09a	HRC 7e11	08	7e 2	Us+Mb
1	09a	HRC 7e11+ HRC 3w02	08	7e 2+3w 1	Mj+Al
7	09a	HRC 7e24	08	7e12	Mb
6	09a	HRC 7e24	08	7e12	Mj
3	09a	HRC 7e24	08	7e12	Mj+Mb
1	09a	HRC 7e24	08	7e12	Mj+Sb
1	09a	HRC 8e03	08	8e 1	Mj+Mb
1	09b	HRC 6e07	02	6e 3	(Mo)/Mb
1	09b	HRC 6e07	10	6e 5	(Mo)+Sm
15	09b	HRC 6e07	10	6e 5	(Mo)/Mb
1	09b	HRC 6e07	10	6e 5	(Mo)/Mb+Sm
1	09b	HRC 6e07	10	6e 5	(Mo)/Mj+Mb
1	09b	HRC 6e07	10	6e 5	Kt/Mo/Mb
12	09b	HRC 6e07	10	6e 5	Mb
4	09b	HRC 6e07	10	6e 5	Mo/La/Mb
142	09b	HRC 6e07	10	6e 5	Mo/Mb
15	09b	HRC 7e05	08	7e 2	Mb
1	09b	HRC 7e05	08	7e 2	Mb+Gr
2	09b	HRC 7e05	08	7e 2	Mb+Li
3	09b	HRC 7e05	08	7e 2	Mb+Mj
3	09b	HRC 7e05	08	7e 2	Mb+Sm
51	09b	HRC 7e11	10	7e 7	Mb
2	09b	HRC 8e03	08	8e 1	Mb
3	09b	HRC 8e03	10	8e 3	Mb
6	09b	HRC 8e03	10	8e 3	Mm
1	09b	HRC 8e03	10	8e 3	Mm+La
4	09b	HRC 8e03	10	8e 3	Mm+Sm
1	09b	HRC 8e03	10	8e 3	Mm+Tp
2	09b	HRC 8e03+HRC 2s01	10	8e 3+2s 1	Mm+Al

1	09b	HRC 8e03+HRC 4e20	10	8e 3+4e13	Mb+Tp
1	09b	HRC 8e04	08	8e 2	Mj+Sm
1	09b	HRC 8e04	08	8e 2	Mm
1	10a	HRC 6e09	10	6e 7	(Lo)/Mm
1	10a	HRC 6e09	10	6e 7	(Lo)/Mm+Sm
3	10a	HRC 6e09	10	6e 7	(Lo)/Sm
25	10a	HRC 6e09	10	6e 7	Mm
4	10a	HRC 6e09	10	6e 7	Mm+Sm
24	10a	HRC 6e09	10	6e 7	Sm
2	10a	HRC 6e10	10	6e 8	(Lo)/Mm+Sm
2	10a	HRC 6e10	10	6e 8	(Mo)/Mm
1	10a	HRC 6e10	10	6e 8	(Mo)/Sm
1	10a	HRC 6e10	10	6e 8	Lo/Mm+Sm
29	10a	HRC 6e10	10	6e 8	Mm
2	10a	HRC 6e10	10	6e 8	Mm+Sm
38	10a	HRC 6e10	10	6e 8	Sm
1	10a	HRC 6e10	10	6e 8	Sm+Us
1	10a	HRC 6e10	10	6e 8	Sm/Mm
16	10a	HRC 6e12	10	6e10	(Mo)/Mm
6	10a	HRC 6e12	10	6e10	(Mo)/Mm+Mj
8	10a	HRC 6e12	10	6e10	(Mo)/Mm+Sm
26	10a	HRC 6e12	10	6e10	(Mo)/Sm
1	10a	HRC 6e12	10	6e10	(Mo)/Sm+Mj
15	10a	HRC 6e12	10	6e10	(Mo)/Sm+Mm
11	10a	HRC 6e12	10	6e10	Mm
1	10a	HRC 6e12	10	6e10	Mm+Mj
1	10a	HRC 6e12	10	6e10	Mm+Sm
1	10a	HRC 6e12	10	6e10	Mo/Mb
41	10a	HRC 6e12	10	6e10	Mo/Mm
6	10a	HRC 6e12	10	6e10	Mo/Sm
4	10a	HRC 6e12	10	6e10	Mo/Sm+Mm
3	10a	HRC 6e12	10	6e10	Sm
1	10a	HRC 6e12	10	6e10	Sm+Mj
2	10a	HRC 6e12	10	6e10	Sm+Mm
14	10a	HRC 7e05	10	7e 4	Mm
1	10a	HRC 7e05	10	7e 4	Mm+Sm
37	10a	HRC 7e05	10	7e 4	Sm
1	10a	HRC 7e05	10	7e 4	Sm+Gr
1	10a	HRC 7e05	10	7e 4	Sm+Mj
1	10a	HRC 7e05	10	7e 4	Sm+Mm
2	10a	HRC 7e05+HRC 3e06	10	7e 4+3e 4	Mm+Al
1	10a	HRC 7e13	10	7e 9	(Mo)/Mm
39	10a	HRC 7e13	10	7e 9	Mm
1	10a	HRC 7e13	10	7e 9	Mm+Mj
27	10a	HRC 7e13	10	7e 9	Mm+Sm
9	10a	HRC 7e13	10	7e 9	Mo/Mm
53	10a	HRC 7e13	10	7e 9	Sm
5	10a	HRC 7e13	10	7e 9	Sm+Mj

16	10a	HRC 7e13	10	7e 9	Sm+Mm
2	10b	HRC 7e32	10	7e20	Sm+Mj
7	11a	HRC 6e17	10	6e12	Us
1	11a	HRC 6e17	10	6e12	Us+Sm
17	11a	HRC 6e22	10	6e14	Us
1	11a	HRC 6e22	10	6e14	Us+Gr
2	11a	HRC 6e22	10	6e14	Us+Li
2	11a	HRC 7e27	10	7e16	Sm
3	11a	HRC 7e27	10	7e16	Sm+Us
30	11a	HRC 7e27	10	7e16	Us
1	11a	HRC 7e27	10	7e16	Us+Gr
11	11a	HRC 7e27	10	7e16	Us+Sm
3	11a	HRC 8e02	10	8e 2	Us
6	11a	HRC 8e02	10	8e 2	Us+Sm
2	11a	HRC 8e02+HRC 3s06	10	8e 2+3s 6	Tp
12	11b	HRC 6e17	10	6e12	(Lo)/Sm
1	11b	HRC 6e17	10	6e12	(Lo)/Sm+Gr
2	11b	HRC 6e17	10	6e12	(Lo+Mo)/Us
5	11b	HRC 6e17	10	6e12	(Mo)/Sm
1	11b	HRC 6e17	10	6e12	Gr+Sm
1	11b	HRC 6e17	10	6e12	Lo/Sm+Mj
6	11b	HRC 6e17	10	6e12	Lo/Sm+Us
47	11b	HRC 6e17	10	6e12	Sm
1	11b	HRC 6e17	10	6e12	Sm+Li
1	11b	HRC 6e17	10	6e12	Sm+Mm
2	11b	HRC 6e17	10	6e12	Sm+Us
1	11b	HRC 6e17+HRC 4e03	10	6e12+4e 3	Lo/Sm+Gr
7	11b	HRC 6e22	08	6e 9	(Lo)/Sm
2	11b	HRC 6e22	08	6e 9	(Lo)/Sm+Li
1	11b	HRC 6e22	08	6e 9	(Lo)/Us
1	11b	HRC 6e22	08	6e 9	(Lo)/Us+Li
1	11b	HRC 6e22	08	6e 9	(Lo)/Us+Sm
1	11b	HRC 6e22	08	6e 9	Gr+Li
1	11b	HRC 6e22	08	6e 9	Lo/Sm
1	11b	HRC 6e22	08	6e 9	Mj
5	11b	HRC 6e22	08	6e 9	Sb
124	11b	HRC 6e22	08	6e 9	Sm
8	11b	HRC 6e22	08	6e 9	Sm+(Li)
1	11b	HRC 6e22	08	6e 9	Sm+Gr
16	11b	HRC 6e22	08	6e 9	Sm+Li
1	11b	HRC 6e22	08	6e 9	Sm+Mj
1	11b	HRC 6e22	08	6e 9	Sm+Mm
1	11b	HRC 6e22	08	6e 9	Sm+Sb
1	11b	HRC 6e22	10	6e14	(Lo)/Gr/Sm
31	11b	HRC 6e22	10	6e14	(Lo)/Sm
2	11b	HRC 6e22	10	6e14	(Lo)/Sm+Gr
1	11b	HRC 6e22	10	6e14	(Lo)/Sm+Mm
2	11b	HRC 6e22	10	6e14	(Lo)/Sm+Us

1	11b	HRC 6e22	10	6e14	(Mo)/Sm
6	11b	HRC 6e22	10	6e14	Lo+Mo/Sm
3	11b	HRC 6e22	10	6e14	Lo/Gr/Sm
7	11b	HRC 6e22	10	6e14	Lo/Sm
1	11b	HRC 6e22	10	6e14	Lo/Sm+Us
1	11b	HRC 6e22	10	6e14	Mo/Sm
133	11b	HRC 6e22	10	6e14	Sm
3	11b	HRC 6e22	10	6e14	Sm+Gr
2	11b	HRC 6e22	10	6e14	Sm+Mm
3	11b	HRC 6e22	10	6e14	Sm+Us
28	11b	HRC 7e04	10	7e 3	Sm
2	11b	HRC 7e04	10	7e 3	Sm+Gr
3	11b	HRC 7e04	10	7e 3	Sm+Li
2	11b	HRC 7e04	10	7e 3	Sm+Us
1	11b	HRC 7e04	10	7e 3	Sm/Mm
9	11b	HRC 7e07	08	7e 4	Sb
43	11b	HRC 7e07	08	7e 4	Sm
1	11b	HRC 7e07	08	7e 4	Sm+(Li)
1	11b	HRC 7e07	08	7e 4	Sm+Gr
26	11b	HRC 7e07	08	7e 4	Sm+Li
3	11b	HRC 7e07	08	7e 4	Sm+Mj
1	11b	HRC 7e07	08	7e 4	Sm+Mj+Li
2	11b	HRC 7e07	08	7e 4	Sm+Mm
1	11b	HRC 7e07	08	7e 4	Sm+Sb
60	11b	HRC 7e07	10	7e 5	Sm
1	11b	HRC 7e07	10	7e 5	Sm+Us
3	11b	HRC 8e03	08	8e 1	Sm
2	11b	HRC 8e03	08	8e 1	Sm+Li
92	11b	HRC 8e03	10	8e 3	Sm
1	11b	HRC 8e03	10	8e 3	Sm+La
1	11b	HRC 8e03	10	8e 3	Sm+Mb
1	11b	HRC 8e03	10	8e 3	Sm+Mj
6	11b	HRC 8e03	10	8e 3	Sm+Mm
2	11b	HRC 8e03	10	8e 3	Sm+Us
1	11b	HRC 8e03	10	8e 3	Gr/Sm
1	11b	HRC 8e03	10	8e 3	La/Mm/Sm
1	11b	HRC 8e03	10	8e 3	La/Sm
1	11b	HRC 8e03	10	8e 3	Mo/Sm
1	11b	HRC 8e03+HRC 2w02	08	8e 1+2w 1	Sm+Al
1	11b	HRC 8e03+HRC 2c01	10	8e 3+2c 1	Mo/Sm+Gr
1	11b	HRC 8e03+HRC 3c01	10	8e 3+3c 1	(Mo)/Sm+La
1	11b	HRC 8e03+HRC 3c01	10	8e 3+3c 1	Sm+Mo/La
1	11b	HRC 8e03+HRC 3e07	10	8e 3+3e 5	(Mo)/Sm+Lo
1	11b	HRC 8e03+HRC 3s01	10	8e 3+3s 2	Sm+Gr
1	11b	HRC 8e03+HRC 3w02	10	8e 3+3w 2	Sm+Al
12	11c	HRC 6e13	10	6e11	(Lo)/Sm
5	11c	HRC 6e13	10	6e11	(Lo)/Sm+Us
1	11c	HRC 6e13	10	6e11	(Lo)/Us+Sm

3	11c	HRC 6e13	10	6e11	Lo/Sm+Gr
2	11c	HRC 6e13	10	6e11	Lo/Sm+Us
1	11c	HRC 6e13	10	6e11	Lo/Us+Gr
1	11c	HRC 6e13	10	6e11	Lo/Us+Sm
3	11c	HRC 6e13	10	6e11	Mm+Us
50	11c	HRC 6e13	10	6e11	Sm
1	11c	HRC 6e13	10	6e11	Sm+(Gr)
2	11c	HRC 6e13	10	6e11	Sm+Gr
3	11c	HRC 6e13	10	6e11	Sm+Mm
7	11c	HRC 6e13	10	6e11	Sm+Us
1	11c	HRC 6e13	10	6e11	Us
1	11c	HRC 6e13	10	6e11	Us+Gr
1	11c	HRC 6e13	10	6e11	Us+Mm
2	11c	HRC 6e13	10	6e11	Us+Sm
2	11c	HRC 7e08	10	7e 6	(Lo)/Us+Mm
3	11c	HRC 7e08	10	7e 6	(Lo)/Us+Sm
5	11c	HRC 7e08	10	7e 6	Sm
2	11c	HRC 7e08	10	7e 6	Sm+Gr
4	11c	HRC 7e08	10	7e 6	Sm+Us
2	11c	HRC 7e08	10	7e 6	Us
1	11c	HRC 7e08	10	7e 6	Us+Mm
3	11d	HRC 6e21	10	6e13	(Lo)/Sm
2	11d	HRC 6e21	10	6e13	Lo+Mo/Sm
1	11d	HRC 6e21	10	6e13	Lo/Sm+Gr
39	11d	HRC 6e21	10	6e13	Sm
1	11d	HRC 6e21	10	6e13	Sm+Li
4	11d	HRC 6e21	10	6e13	Sm+Mm
1	11d	HRC 6e21	10	6e13	Us
2	11d	HRC 6e23	10	6e15	(Lo)/Sm
1	11d	HRC 6e23	10	6e15	(Lo)/Us+Sm
4	11d	HRC 6e23	10	6e15	(Mo)/Sm
4	11d	HRC 6e23	10	6e15	Lo/Sm
76	11d	HRC 6e23	10	6e15	Sm
3	11d	HRC 6e37	10	6e23	(Mo)/(La)/Sm
1	11d	HRC 6e37	10	6e23	(Mo)/La/Sm
4	11d	HRC 6e37	10	6e23	(Mo)/Mm
1	11d	HRC 6e37	10	6e23	(Mo)/Mm+Sm
93	11d	HRC 6e37	10	6e23	(Mo)/Sm
1	11d	HRC 6e37	10	6e23	(Mo)/Sm+(Li)
2	11d	HRC 6e37	10	6e23	(Mo)/Sm+Li
1	11d	HRC 6e37	10	6e23	(Mo)/Sm+Mj
10	11d	HRC 6e37	10	6e23	(Mo)/Sm+Mm
1	11d	HRC 6e37	10	6e23	Mo/La
2	11d	HRC 6e37	10	6e23	Mo/La+Sm
21	11d	HRC 6e37	10	6e23	Mo/Sm
21	11d	HRC 6e37	10	6e23	Sm
1	11d	HRC 6e37	10	6e23	Sm+Li
4	11d	HRC 6e37	10	6e23	Sm+Mm

30	11d	HRC 7e16	10	7e11	(Mo)/Sm
3	11d	HRC 7e16	10	7e11	(Mo)/Sm+Mj
2	11d	HRC 7e16	10	7e11	(Mo)/Sm+Mm
527	11d	HRC 7e16	10	7e11	Sm
10	11d	HRC 7e16	10	7e11	Sm+Mj
52	11d	HRC 7e16	10	7e11	Sm+Mm
1	11d	HRC 7e16	10	7e11	La
1	11d	HRC 7e16	10	7e11	La/Sm+Mm
1	11d	HRC 7e16	10	7e11	Mb
1	11d	HRC 7e16	10	7e11	Mo/Mj
19	11d	HRC 7e16	10	7e11	Mo/Sm
2	11d	HRC 7e16+HRC 6e37	10	7e11+6e23	(Mo)/Sm+Mm
1	11d	HRC 7e21	10	7e13	(Mo)/Sm
82	11d	HRC 7e21	10	7e13	Sm
1	11d	HRC 7e21	10	7e13	Sm+Mj
12	11d	HRC 7e21	10	7e13	Sm+Mm
1	11d	HRC 7e21+HRC 8e03	10	7e13+8e 3	Sm
3	11d	HRC 7e30	04	7e11	Mo/Sm
1	11d	HRC 8e03	08	8e 1	Sb
1	11e	HRC 6e19	02	6e 7	Sm
1	11e	HRC 6e19	02	6e 7	Sm+Vo
33	11e	HRC 6e29	10	6e17	(Mo)/Sm
4	11e	HRC 6e29	10	6e17	(Mo)/Sm+Mm
1	11e	HRC 6e29	10	6e17	Kt/Mo/Sm
1	11e	HRC 6e29	10	6e17	Kt/Mo/Sm+Vo
3	11e	HRC 6e29	10	6e17	Mo/Gw
5	11e	HRC 6e29	10	6e17	Mo/La
136	11e	HRC 6e29	10	6e17	Mo/Sm
1	11e	HRC 6e29	10	6e17	Mo/Sm+(Mb)
1	11e	HRC 6e29	10	6e17	Mo/Sm+Mm
7	11e	HRC 6e29	10	6e17	Mo/Vo
14	11e	HRC 6e29	10	6e17	Sm
1	11e	HRC 6e29	10	6e17	Sm+Mb
3	11e	HRC 6e29	10	6e17	Sm+Vo
37	11e	HRC 6s07	08	6s 2	Sb
1	11e	HRC 6s07	08	6s 2	Sb+Li
13	11e	HRC 6s07	08	6s 2	Sm
2	11e	HRC 6s07	08	6s 2	Sm+Ac
1	11e	HRC 6s07	08	6s 2	Sm+Li
3	11e	HRC 7e28	10	7e17	(Mo)/Sm
2	11e	HRC 7e28	10	7e17	Kt/Mo/Sm
4	11e	HRC 7e28	10	7e17	Mm
1	11e	HRC 7e28	10	7e17	Mo/Sm
127	11e	HRC 7e28	10	7e17	Sm
9	11e	HRC 7e28	10	7e17	Sm+Mb
3	11e	HRC 7e28	10	7e17	Sm+Mm
1	11e	HRC 7e28	10	7e17	Sm/Mm
12	11e	HRC 7s02	08	7s 2	Sb

2	12	HRC 4e10	10	4e 8	(Mo)/Mb
3	12	HRC 4e10	10	4e 8	(Mo)/Mj
1	12	HRC 4e10	10	4e 8	(Mo)/Mm
1	12	HRC 4e10	10	4e 8	(Mo)/Sm
1	12	HRC 4e10	10	4e 8	Lo/Sm
16	12	HRC 4e10	10	4e 8	Mm
1	12	HRC 4e10	10	4e 8	Mo
3	12	HRC 4e10	10	4e 8	Mo/Mj
4	12	HRC 4e10	10	4e 8	Mo/Mm
4	12	HRC 4e10	10	4e 8	Sm
1	12	HRC 4e10	10	4e 8	Sm+Us
1	12	HRC 4e10+HRC 6e32	10	4e 8+6e20	Mm
1	12	HRC 4e10+HRC 7e03	10	4e 8+7e 2	(Mo)/Mm
1	12	HRC 6e31	10	6e19	(Lo)/Mm
2	12	HRC 6e31	10	6e19	(Lo)/Mm+Sm
1	12	HRC 6e31	10	6e19	(Mo)/Mm
15	12	HRC 6e31	10	6e19	Mm
1	12	HRC 6e31	10	6e19	Mm+Sm
19	12	HRC 6e31	10	6e19	Sm
1	12	HRC 6e31	10	6e19	Sm+Mm
1	12	HRC 6e31	10	6e19	Sm+Us
1	12	HRC 6e31	10	6e19	Us
2	12	HRC 6e31	10	6e19	Us+Sm
5	12	HRC 6e32	08	6e10	(Lo)/Us
2	12	HRC 6e32	08	6e10	Gw
3	12	HRC 6e32	08	6e10	Mb+Gr
27	12	HRC 6e32	08	6e10	Mj
3	12	HRC 6e32	08	6e10	Mj+Mb
1	12	HRC 6e32	08	6e10	Mj+Wb
1	12	HRC 6e32	08	6e10	Us
32	12	HRC 6e32	10	6e20	(Mo)/Mb
1	12	HRC 6e32	10	6e20	(Mo)/Mb+Sm
3	12	HRC 6e32	10	6e20	(Mo)/Mj
1	12	HRC 6e32	10	6e20	(Mo)/Mj+Sm
1	12	HRC 6e32	10	6e20	(Mo)/Mm
1	12	HRC 6e32	10	6e20	(Mo)/Sm+Mb
19	12	HRC 6e32	10	6e20	Kt/Mo/Mj
2	12	HRC 6e32	10	6e20	Mj
1	12	HRC 6e32	10	6e20	Mj+Sm
12	12	HRC 6e32	10	6e20	Mo/Mb
61	12	HRC 6e32	10	6e20	Mo/Mj
1	12	HRC 6e32	10	6e20	Mo/Mj+Mb
1	12	HRC 6e32	10	6e20	Mo/Mj+Sb
4	12	HRC 6e32	10	6e20	Mo/Mm
2	12	HRC 6e32	10	6e20	Sm
1	12	HRC 6e32+HRC 4e01	10	6e20+4e 1	(Mo)/Mb
3	12	HRC 6e33	08	6e10	Me
2	12	HRC 6e33	08	6e10	Mj+Me

7	12	HRC 7e20	08	7e 8	Mb
5	12	HRC 7e20	08	7e 8	Me
2	12	HRC 7e20	08	7e 8	Me+Ac
18	12	HRC 7e20	08	7e 8	Mj
2	12	HRC 7e20	08	7e 8	Mj+Ac
1	12	HRC 7e20	08	7e 8	Mj+Mb
3	12	HRC 7e20	08	7e 8	Mj+Me
1	12	HRC 7e20	10	7e12	(Mo)/Mm
1	12	HRC 7e20	10	7e12	Mj
7	12	HRC 7e20	10	7e12	Mm
2	12	HRC 7e20	10	7e12	Mo/Mj
1	12	HRC 7e20	10	7e12	Sm
1	12	HRC 7e20	10	7e12	Sm+Us
3	12	HRC 7e20	10	7e12	Us
1	12	HRC 7e22	02	7e 4	Mo/Mj
3	12	HRC 7e22	10	7e14	(Mo)/Mj
1	12	HRC 7e22	10	7e14	Kt/Mo/Mj
3	12	HRC 7e22	10	7e14	Mj
1	12	HRC 7e22	10	7e14	Mm+Sm
1	12	HRC 7e22	10	7e14	Mo/Mb
4	12	HRC 7e22	10	7e14	Mo/Mj
1	12	HRC 7e22	10	7e14	Sm
2	12	HRC 7e23	08	7e 9	Us
4	12	HRC 7e23	08	7e 9	Us+Gr
4	13a	HRC 6e25	08	6e11	Gr+Gw
37	13a	HRC 6e25	08	6e11	Gw
6	13a	HRC 6e25	08	6e11	Gw+Gr
26	13a	HRC 6e25	09	6e 8	(Lo)/Gw
35	13a	HRC 6e25	09	6e 8	Gw
9	13a	HRC 6e25	09	6e 8	Lo/Gw
12	13a	HRC 6e25	10	6e16	Gw
1	13a	HRC 6e25+HRC 6c02	09	6e 8+6c 1	(Lo)/Gw
4	13a	HRC 6e28	09	6e10	Gw
94	13a	HRC 7e14	09	7e 2	Gw
2	13a	HRC 7e14	10	7e10	(Pt)/Gw
27	13a	HRC 7e14	10	7e10	Gw
2	13a	HRC 7e14	10	7e10	Gw+Sm
1	13a	HRC 7e15	08	7e10	Gr
31	13a	HRC 7e15	08	7e10	Gw
37	13a	HRC 7e15	09	7e 5	Gw
2	13a	HRC 8c01	07	8e10	(Mo)/Gw
2	13a	HRC 8c01	07	8e10	Kt/Mo/Gw
1	13a	HRC 8c01	04	8c 1	Kt/Mo/Gw
1	13a	HRC 8c01	04	8c 1	Ng/Mo/Gw
1	13a	HRC 8c01	08	8c 1	Gw
2	13a	HRC 8c01	08	8c 1	Pt/Gw
1	13a	HRC 8c01	10	8c 1	(Pt)/Gw
5	13a	HRC 8c01	10	8c 1	Gw

3	13a	HRC 8c01	10	8c 1	Kt/Mo/Gw
1	13a	HRC 8c01	10	8c 1	Mo/Gw
10	13a	HRC 8c01	10	8c 1	Ng/Mo/Gw
4	13a	HRC 8c01	10	8c 1	Pt/Gw
5	13a	HRC 8e05	02	8e 1	Sm
4	13a	HRC 8e05	04	8e 3	(Mo)/Gw
1	13a	HRC 8e05	04	8e 3	Kt/Mo/Gw
3	13a	HRC 8e05	04	8e 3	Mo/Gw
1	13a	HRC 8e05	07	8e 5	(Mo)/Gw
1	13a	HRC 8e05	07	8e 5	Gw
2	13a	HRC 8e05	07	8e 5	Sm
26	13a	HRC 8e05	08	8e 5	Gw
2	13a	HRC 8e05	08	8e 5	Gw
69	13a	HRC 8e05	09	8e 3	Gw
6	13a	HRC 8e05	10	8e 4	(Mo)/Gw
91	13a	HRC 8e05	10	8e 4	Gw
7	13a	HRC 8e05	10	8e 4	Kt/Mo/Gw
24	13a	HRC 8e05	10	8e 4	Mo/Gw
2	13a	HRC 8e05	10	8e 4	Sm
2	13a	HRC 8e05	10	8e 4	(Kt)/Mo/Sm
8	13a	HRC 8e05	10	8e 4	(Ng)/Mo/Gw
1	13a	HRC 8e06	07	8e 8	(Mo)/Gw+Sm
2	13a	HRC 8e06	10	8e 5	(Kt)/Mo/Gw
7	13a	HRC 8e06	10	8e 5	(Mo)/Gw
2	13a	HRC 8e06	10	8e 5	Gw
1	13a	HRC 8e06	10	8e 5	Kt/Mo/Gw
4	13a	HRC 8e06	10	8e 5	Mo/Gw
1	13a	HRC 8e07	10	8e 6	(Mo)/Sm
2	13a	HRC 8e07	10	8e 6	Sm
1	13a	HRC 8e08	07	8e 6	Gw
11	13a	HRC 8e08	08	8e 6	Gw
5	13a	HRC 8e08	09	8e 4	Gw
28	13a	HRC 8e08	10	8e 7	Gw
4	13a	HRC 8e09	04	8e 6	(Mo)/Gw
2	13a	HRC 8e09	04	8e 6	Kt/Mo/Gw
5	13a	HRC 8e09	08	8e 8	Gw
5	13a	HRC 8e09	10	8e 8	(Kt)/Mo/Gw
23	13a	HRC 8e09	10	8e 8	(Mo)/Gw
1	13a	HRC 8e09	10	8e 8	(Mo)/Gw+Sm
2	13a	HRC 8e09	10	8e 8	(Ng)/Gw
5	13a	HRC 8e09	10	8e 8	(Ng)/Mo/Gw
25	13a	HRC 8e09	10	8e 8	Gw
25	13a	HRC 8e09	10	8e 8	Kt/Mo/Gw
20	13a	HRC 8e09	10	8e 8	Mo/Gw
3	13a	HRC 8e09	10	8e 8	Ng/Mo/Gw
1	13a	HRC 8e10	07	8e11	Mo/Gw
1	13a	HRC 8e11	04	8e 7	(Mo)/Gw
1	13a	HRC 8e11	04	8e 7	Gw

1	13a	HRC 8e11	04	8e 7	Kt/Mo/Gw
2	13a	HRC 8e11	04	8e 7	Mo/Gw
8	13a	HRC 8e11	07	8e 9	(Mo)/Gw
1	13a	HRC 8e11	07	8e 9	Gw
2	13a	HRC 8e11	07	8e 9	Mo/Gw
1	13a	HRC 8e11	07	8e 9	Sm
10	13a	HRC 8e11	08	8e 9	Gw
21	13a	HRC 8e11	09	8e 5	Gw
2	13a	HRC 8e11	10	8e 9	(Kt)/Mo/Gw
7	13a	HRC 8e11	10	8e 9	(Mo)/Gw
8	13a	HRC 8e11	10	8e 9	(Ng)/Mo/Gw
20	13a	HRC 8e11	10	8e 9	Gw
1	13a	HRC 8e11	10	8e 9	Kt/Mo/Gw
9	13a	HRC 8e11	10	8e 9	Mo/Gw
4	13b	HRC 3c03	09	3c 1	Lo
2	13b	HRC 4c01	09	4c 1	Lo
1	13b	HRC 4c01	09	4c 1	Lo/Gw
8	13b	HRC 4e16	09	4e 5	Lo
4	13b	HRC 4e16	09	4e 5	Lo/Gw
1	13b	HRC 6c02	09	6c 1	(Lo)/Gw
5	13b	HRC 6c02	09	6c 1	Gw
1	13b	HRC 6c02	09	6c 1	Lo
50	13b	HRC 6c02	09	6c 1	Lo/Gw
1	13b	HRC 6c02+HRC 6e24	09	6c 1+6e 6	(Lo)/Gw
1	13b	HRC 7c02	09	7c 1	Gr+Gw
10	13b	HRC 7c02	09	7c 1	Gw
14	13c	HRC 6e24	09	6e 6	(Lo)/Gw
7	13c	HRC 6e24	09	6e 6	Gw
3	13c	HRC 6e24	09	6e 6	Lo/Gw
1	13c	HRC 6e24	09	6e 6	Lo/Us
6	13c	HRC 6e27	09	6e 9	Gw
7	13c	HRC 6s06	09	6s 6	Lo/Gw
5	13c	HRC 6s06	09	6s 6	Lo/Gw+Sm
1	13c	HRC 6s08	08	6s 3	(Lo)/Gw
20	13c	HRC 6s08	08	6s 3	Gw
1	13c	HRC 6s08+HRC 6e34	08	6s 3+6e12	Gw+Ac
20	13c	HRC 7e09	09	7e 1	Gw
1	13c	HRC 7e09	09	7e 1	Us
1	13c	HRC 7e10	08	7e 5	Ac
2	13c	HRC 7e10	08	7e 5	Gr
2	13c	HRC 7e10	08	7e 5	Gr+Gw
22	13c	HRC 7e10	08	7e 5	Gw
1	14	HRC 8c01	04	8c 1	Kt/Mo/Vo
2	14	HRC 8c01	10	8c 1	(Kt)/Mo
1	14	HRC 8c01	10	8c 1	(Kt)/Mo/Vo
1	14	HRC 8c01	10	8c 1	(Ng)/Vo
1	14	HRC 8c01	10	8c 1	Kt/Mo
1	14	HRC 8c01	10	8c 1	Kt/Mo+Tp

6	14	HRC 8c01	10	8c 1	Kt/Mo/Vo
6	14	HRC 8c01	10	8c 1	Mo/Vo
8	14	HRC 8c01	10	8c 1	Ng/Kt/Mo
1	14	HRC 8c01	10	8c 1	Ng/Kt/Vo
6	14	HRC 8c01	10	8c 1	Ng/Mo
1	14	HRC 8c01	10	8c 1	Ng/Mo/Vo
2	14	HRC 8c01	10	8c 1	Ng/Vo
1	14	HRC 8c01	10	8c 1	Tp
1	14	HRC 8e05	04	8e 3	Mo/Vo
2	14	HRC 8e09	04	8e 6	Kt/Mo/Vo
1	14	HRC 8e09	04	8e 6	Ng/Mo
1	14	HRC 8e09	04	8e 6	Ng/Vo
2	14	HRC 8e09	04	8e 6	Vo
1	14	HRC 8e09	10	8e 8	(Kt)/Mo
1	14	HRC 8e09	10	8e 8	(Mo)/Vo
2	14	HRC 8e09	10	8e 8	(Ng)/Mo/Vo
2	14	HRC 8e09	10	8e 8	(Ng)/Vo
1	14	HRC 8e09	10	8e 8	(Ng/Mo)/Vo
2	14	HRC 8e09	10	8e 8	Kt/Mo
14	14	HRC 8e09	10	8e 8	Kt/Mo/Vo
1	14	HRC 8e09	10	8e 8	La
5	14	HRC 8e09	10	8e 8	Mo/Vo
5	14	HRC 8e09	10	8e 8	Ng/Kt/Mo
1	14	HRC 8e09	10	8e 8	Ng/Mo
5	14	HRC 8e09	10	8e 8	Ng/Mo/Vo
7	14	HRC 8e09	10	8e 8	Ng/Vo
9	14	HRC 8e09	10	8e 8	Vo
3	14	HRC 8e11	04	8e 7	Ng/Vo
2	14	HRC 8e11	04	8e 7	Vo
1	14	HRC 8e05	10	8e 4	(Kt)/Mo/Vo
1	14	HRC 8e05	10	8e 4	(Mo)/Vo
1	14	HRC 8e05	10	8e 4	Kt/Mo/Vo
1	14	HRC 8e05	10	8e 4	La
1	14	HRC 8e05	10	8e 4	La/Sm
5	14	HRC 8e05	10	8e 4	Mo/Vo
1	14	HRC 8e05	10	8e 4	Ng/Kt/Mo
1	14	HRC 8e05	10	8e 4	Ng/Vo
1	14	HRC 8e05	10	8e 4	Vo
1	14	HRC 8e05	10	8e 4	Vo+Tp
2	14	HRC 8e08	10	8e 7	(Mo)/Vo
3	14	HRC 8e11	10	8e 9	(Ng)/Mo/Vo
1	14	HRC 8e11	10	8e 9	(Ng/Mo)/Vo
1	14	HRC 8e11	10	8e 9	Ng/Kt/Mo
5	14	HRC 8e11	10	8e 9	Ng/Vo
2	14	HRC 8e11	10	8e 9	Vo
2	15	HRC 4e05	08	4e 4	Li
1	15	HRC 4e05	08	4e 4	Mj
8	15	HRC 5c02	08	5c 1	Li

1	15	HRC 5c02	08	5c 1	Li+Sm
6	15	HRC 6c01	08	6c 1	Li
2	15	HRC 6c01	08	6c 1	Li+Sm
27	15	HRC 6c03	08	6c 2	Li
2	15	HRC 6c03	08	6c 2	Li+Sm
4	15	HRC 6e16	08	6e 5	Li
2	15	HRC 6e16	08	6e 5	Li+(Sm)
5	15	HRC 6e16	08	6e 5	Li+Mj
17	15	HRC 6e16	08	6e 5	Li+Sm
3	15	HRC 6e16	08	6e 5	Mj+Li
1	15	HRC 6e16	08	6e 5	Sb+Li
1	15	HRC 6e16	08	6e 5	Sm
1	15	HRC 6e16	08	6e 5	Sm+(Li)
9	15	HRC 6e16	08	6e 5	Sm+Li
9	15	HRC 7e06	08	7e 3	Li
6	15	HRC 7e06	08	7e 3	Li+Sm
1	15	HRC 7e06	08	7e 3	Mb+Li
1	15	HRC 7e07	08	7e 4	Li
2	15	HRC 8e03	08	8e 1	Li
4	16	HRC 3s07	08	3s 4	Al
5	16	HRC 3s07	08	3s 4	Gr
3	16	HRC 4e15	08	4e 5	Ac
2	16	HRC 4e15	08	4e 5	Al
4	16	HRC 4e15	08	4e 5	Ar
40	16	HRC 6e34	08	6e12	Ac
9	16	HRC 6e34	08	6e12	Ac+Ar
3	16	HRC 6e34	08	6e12	Ac+Gw
1	16	HRC 6e34	08	6e12	Ac+Mj
1	16	HRC 6e34	08	6e12	Ar
1	16	HRC 6e34	08	6e12	Mj
4	16	HRC 6e35	08	6e13	Ac
58	16	HRC 6e35	08	6e13	Ar
17	16	HRC 6e35	08	6e13	Ar+Ac
4	16	HRC 7e17	08	7e11	Ac
35	16	HRC 7e17	08	7e11	Ar
27	16	HRC 7e18	08	7e 6	Ac
1	16	HRC 7e18	08	7e 6	Ac+Gw
3	16	HRC 7e18+HRC 7e10	08	7e 6+7e 5	Ac+Gw
14	16	HRC 7e19	08	7e 7	Ac
13	16	HRC 7e19	08	7e 7	Ac+Ar
5	16	HRC 7e19	08	7e 7	Ar+Ac
2	16	HRC 8e03	08	8e 1	Ar+Ac
6	lake	lake	09	lake	lake
8	lake	lake	10	lake	lake
6	rive	rive	10	rive	rive
3	town	town	08	town	town
8	town	town	09	town	town
15	town	town	10	town	town