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THE DISTRIBUTION OF GOLD AND OTHER ELEMENTS IN SOILS AND VEGETATION AT ZULEIKA, WESTERN AUSTRALIA

M.J. Lintern and C.R.M. Butt

CRC LEME OPEN FILE REPORT 52

November 1998

(CSIRO Division of Exploration Geoscience Report 328R, 1992.
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CRC LEME is an unincorporated joint venture between The Australian National University, University of Canberra, Australian Geological Survey Organisation and CSIRO Exploration and Mining
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RESEARCH ARISING FROM CSIRO/AMIRA REGOLITH GEOCHEMISTRY PROJECTS 1987-1993

In 1987, CSIRO commenced a series of multi-client research projects in regolith geology and geochemistry which were sponsored by companies in the Australian mining industry, through the Australian Mineral Industries Research Association Limited (AMIRA). The initial research program, "Exploration for concealed gold deposits, Yilgarn Block, Western Australia" (1987-1993) had the aim of developing improved geological, geochemical and geophysical methods for mineral exploration that would facilitate the location of blind, buried or deeply weathered gold deposits. The program included the following projects:

P240: Laterite geochemistry for detecting concealed mineral deposits (1987-1991). Leader: Dr R.E. Smith.
Its scope was development of methods for sampling and interpretation of multi-element laterite geochemistry data and application of multi-element techniques to gold and polymetallic mineral exploration in weathered terrain. The project emphasised viewing laterite geochemical dispersion patterns in their regolith-landform context at local and district scales. It was supported by 30 companies.

P241: Gold and associated elements in the regolith - dispersion processes and implications for exploration (1987-1991). Leader: Dr C.R.M. Butt.
The project investigated the distribution of ore and indicator elements in the regolith. It included studies of the mineralogical and geochemical characteristics of weathered ore deposits and wall rocks, and the chemical controls on element dispersion and concentration during regolith evolution. This was to increase the effectiveness of geochemical exploration in weathered terrain through improved understanding of weathering processes. It was supported by 26 companies.

These projects represented "an opportunity for the mineral industry to participate in a multi-disciplinary program of geoscience research aimed at developing new geological, geochemical and geophysical methods for exploration in deeply weathered Archaean terrains". This initiative recognised the unique opportunities, created by exploration and open-cut mining, to conduct detailed studies of the weathered zone, with particular emphasis on the near-surface expression of gold mineralisation. The skills of existing and specially recruited research staff from the Floreat Park and North Ryde laboratories (of the then Divisions of Minerals and Geochemistry, and Mineral Physics and Mineralogy, subsequently Exploration Geoscience and later Exploration and Mining) were integrated to form a task force with expertise in geology, mineralogy, geochemistry and geophysics. Several staff participated in more than one project. Following completion of the original projects, two continuation projects were developed.

P240A: Geochemical exploration in complex lateritic environments of the Yilgarn Craton, Western Australia (1991-1993). Leaders: Drs R.E. Smith and R.R. Anand.
The approach of viewing geochemical dispersion within a well-controlled and well-understood regolith-landform and bedrock framework at detailed and district scales continued. In this extension, focus was particularly on areas of transported cover and on more complex lateritic environments typified by the Kalgoorlie regional study. This was supported by 17 companies.

P241A: Gold and associated elements in the regolith - dispersion processes and implications for exploration. Leader: Dr. C.R.M. Butt.
The significance of gold mobilisation under present-day conditions, particularly the important relationship with pedogenic carbonate, was investigated further. In addition, attention was focussed on the recognition of primary lithologies from their weathered equivalents. This project was supported by 14 companies.

Although the confidentiality periods of the research reports have expired, the last in December 1994, they have not been made public until now. Publishing the reports through the CRC LEME Report Series is seen as an appropriate means of doing this. By making available the results of the research and the authors' interpretations, it is hoped that the reports will provide source data for future research and be useful for teaching. CRC LEME acknowledges the Australian Mineral Industries Research Association and CSIRO Division of Exploration and Mining for authorisation to publish these reports. It is intended that publication of the reports will be a substantial additional factor in transferring technology to aid the Australian Mineral Industry.

This report (CRC LEME Open File Report 52) is a Second impression (second printing) of CSIRO, Division of Exploration Geoscience Restricted Report 328R, first issued in 1992, which formed part of the CSIRO/AMIRA Project P241A.

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PREFACE

The CSIRO - AMIRA project P241 "Gold and Associated Elements in the Regolith - Dispersion Processes and Implications for Exploration" includes in its overall objectives the development of improved geological and geochemical methods for mineral exploration that will facilitate the location of blind, concealed or deeply weathered gold deposits. A specific objective of the continuation project (P241A) has been to investigate further the usefulness of soil sampling, particularly of calcareous horizons, in exploration for gold deposits concealed beneath as much as 20 m of weathered transported overburden. This report presents results of research conducted to determine the effectiveness of soil sampling in exploration for secondary mineralization associated with palaeodrainage channels, which present attractive targets in the Kalgoorlie region. Such deposits may be syngenetic or epigenetic with respect to the sediments, but in either case would be expected to be blind, with no surface expression. The recently discovered Zuleika Sands deposits are typical of this style of mineralization and were found by systematic drilling of prospective channel environments. Nevertheless, an effective procedure for surface sampling would represent considerable savings during exploration; the site was selected for detailed study and sampling was completed before mining commenced. Unfortunately, it became apparent as research proceeded that although there is a gold anomaly directly overlying the mineralization, it is overshadowed by one of far greater magnitude in adjacent residual soils. Such 'natural contamination' itself represents a considerable exploration problem, which in this case has resulted in an equivocal result for the research investigation. Exploration elsewhere, however, does indeed suggest that buried mineralization such as that at Zuleika can be revealed by sampling carefully selected soil horizons.

C.R.M. Butt.
Project Leader.

November, 1992

ABSTRACT

This report describes an investigation of a possible surface expression of the Zuleika Sands Au deposits, south of Ora Banda. The deposits are situated within and beneath the sediments of a palaeochannel in a floodplain adjacent to a low rise and pediplain with residual soils. Gold mineralization occurs semi-continuously in the basal sands of the palaeochannel and the underlying saprolite. A variety of sample media were selected, including different soil horizons, surface lag, and vegetation, and analysed for Au and a range of other elements.

Anomalous Au concentrations (mean 28 ppb) were found in calcareous surficial horizons (0 - 1 m) directly overlying the buried mineralization, compared to a mean background of 13 ppb over barren sediments. However, much higher concentrations (mean 141 ppb) are present in equivalent horizons of residual soils associated with subcropping mineralization on the low rise. Because of the proximity of the two areas, it is possible that the anomalies in the floodplain could be derived from downslope dispersion from the residual areas, so that no unequivocal demonstration of the surface expression of the buried mineralization was possible. However, it is known that similar mineralization elsewhere, buried beneath over 20 m of barren sediments and leached saprolite, does give rise to soil anomalies. Gold distributions within topsoils and vegetation were similar to those shown by the calcareous horizon but that of lag was more erratic, with the highest values over the floodplain, suggesting a clastic derivation from the north.

CONTENTS

THE DISTRIBUTION OF GOLD AND OTHER ELEMENTS IN SOILS AND VEGETATION AT ZULEIKA, WESTERN AUSTRALIA

M. J. Lintern and C. R. M. Butt

1 INTRODUCTION

Gold deposits associated with sediments in palaeochannels have been known in the Kalgoorlie - Coolgardie district since late last century. The deposits (known as "leads") were important for the early prospectors although they were difficult to find. Exploration was very speculative, for Au could usually only be found by excavating shafts to several tens of metres in the vicinity of existing hard rock Au deposits, and then burrowing horizontally through the gravels. However, once the Au was found, it was commonly present at very high grades and easy to separate from the gangue minerals. To the early miners, therefore, the palaeochannel deposits represented an important resource; it was expected that many deposits of this type would be discovered although not without a degree of pessimism:

> "*That other leads probably exist is obvious from the geological structure of the district* (Eastern Goldfields), *but owing to the completeness with which the old land surface has been buried beneath more recent accumulations, any other channels can only be tapped by a judicious system of boring, though they are hardly likely to even then to be discovered without many failures.*" Gibb Maitland, 1919.

However, since these early attempts, little systematic exploration of the palaeochannels has been reported until recently (Devlin and Crimeen, 1990; Fulwood and Barwick, 1990). The interest has been complemented by better interpretation of the stratigraphy (Commander *et al*, 1992; Devlin, 1990; Smyth and Button, 1989), and mining and processing techniques to treat the ore (Whincup *et al*, 1989). One of the major reasons for this is economics: how to explore for Au beneath many metres of transported overburden over many kilometres without the use of systematic drilling.

In recent years, geophysical techniques have been used to delineate the palaeochannel boundaries. These have included gravity, seismic reflection and refraction, and down-hole gamma logs (Smyth and Button, 1989). Once the channel has been located, the deepest part (the thalweg) can be located by electromagnetic methods (e.g., SIROTEM). The method assumes that the Tertiary sands located in the thalweg are more saline than those in shallower parts of the channel. Thalwegs are important for exploration as they appear to serve as depositional traps for Au. This can take place by either or both of two processes: mechanically, when the stream or river was active, as primary micro nuggets shed from primary source material; or as chemically precipitated Au because the thalweg can provide a sub-surface aquifer. The chemical deposition of Au is thought still to be active in many cases. However, geophysics only solves part of the problem, since even after the location of a thalweg, it is still only by Gibb Maitland's "*judicious system of boring*" and analysis that the presence or absence of Au can be determined.

The principal objective of this study was to determine whether surficial geochemical techniques can be used to locate economic quantities of Au located in the palaeochannels and thereby reduce the amount of scout drilling that has to be undertaken. The rationale behind this approach has developed from previous studies in the Yilgarn at Panglo (Lintern and Scott, 1990), Mt. Hope

(Lintern, 1989) and Mulline (Lintern and Butt, 1991) which indicated that there is an enrichment of Au in the soil above or close to hard rock mineralization. These previous studies demonstrated that surficial Au enrichment can occur despite the presence of depleted or poorly mineralized overburden or sediments. Typically, the enrichment is associated with a pedogenic carbonate horizon.

The research involved an integrated geomorphological, geochemical and mineralogical study of the area, comprising soils and vegetation from above the palaeochannel with areas adjacent and distant to it. A variety of sample media were examined, including shallow-drill cuttings, topsoils, lag and vegetation. The area chosen for the study (Zuleika Sands) was determined after consultation with staff from Newcrest Mining Ltd.

2 LOCATION AND REGIONAL GEOLOGY

The Zuleika Sands deposits are situated approximately 18 km due south of Ora Banda and are named after (i) the Zuleika Mining Centre and (ii) the lithology with which the Au mineralization is thought to be associated (Figure 1). The regional geology of the area has been described by Harrison *et al*, 1990.

Primary mineralization in the Zuleika Mining Centre is hosted by high-magnesian basalts and commonly associated with shear zones, e.g., at the Zuleika South Pit. Strong soil Au geochemical anomalies occur in clay- and/or carbonate-rich material above the primary mineralization and are separated from it by at least ten metres of poorly mineralized and depleted saprolite.

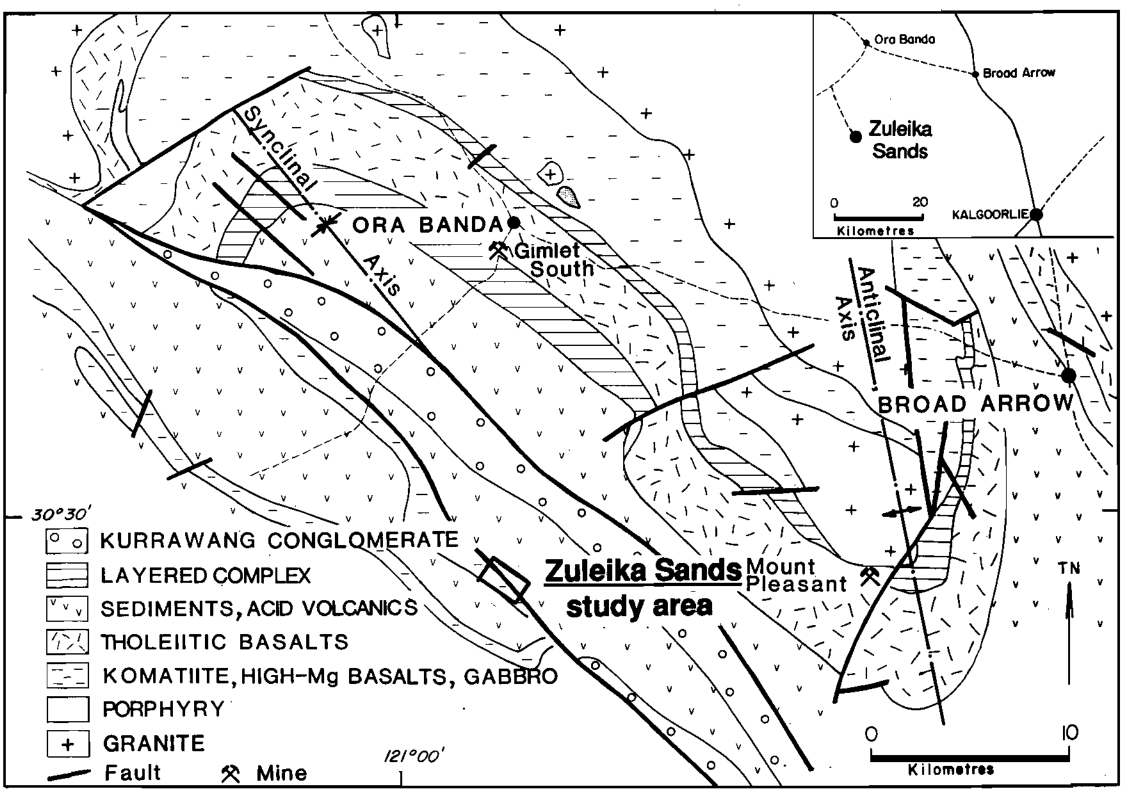


Figure 1. Regional geology, Ora Banda area (after Harrison *et al*, 1990).

The Zuleika Sands deposits occur within and beneath an infilled palaeochannel of presumed Tertiary age. Mineralization in the palaeochannel is divided into three zones which are named, from north to south, San Peblo, Neptune and Sandgroper. The zones are situated to the south and west of known basement mineralization; the closest developed open-pit mine to the deposits (Zuleika South) is situated approximately 500m to the north east of San Peblo (Figure 2).

The origin of the mineralization in the palaeochannel has not been determined. Some sub-economic mineralized zones exist within the palaeochannel sediments but the highest grades seem to occur at the unconformity between the basal sands and the underlying weathered units. In addition, some high grades of mineralization have been identified well below the unconformity (e.g. 5 m at 7.81g/t, 8 m below the sands, 2430E 4625N) which suggests the possibility of another source for the Au. Preliminary examination of Au in heavy mineral concentrates from the palaeochannel shows that the Au particles have low Ag contents and are barely corroded, suggesting recent secondary precipitation. A better understanding of the stratigraphy of the three areas of mineralization will be obtained when the pit has been fully excavated.

3 SITE DESCRIPTION

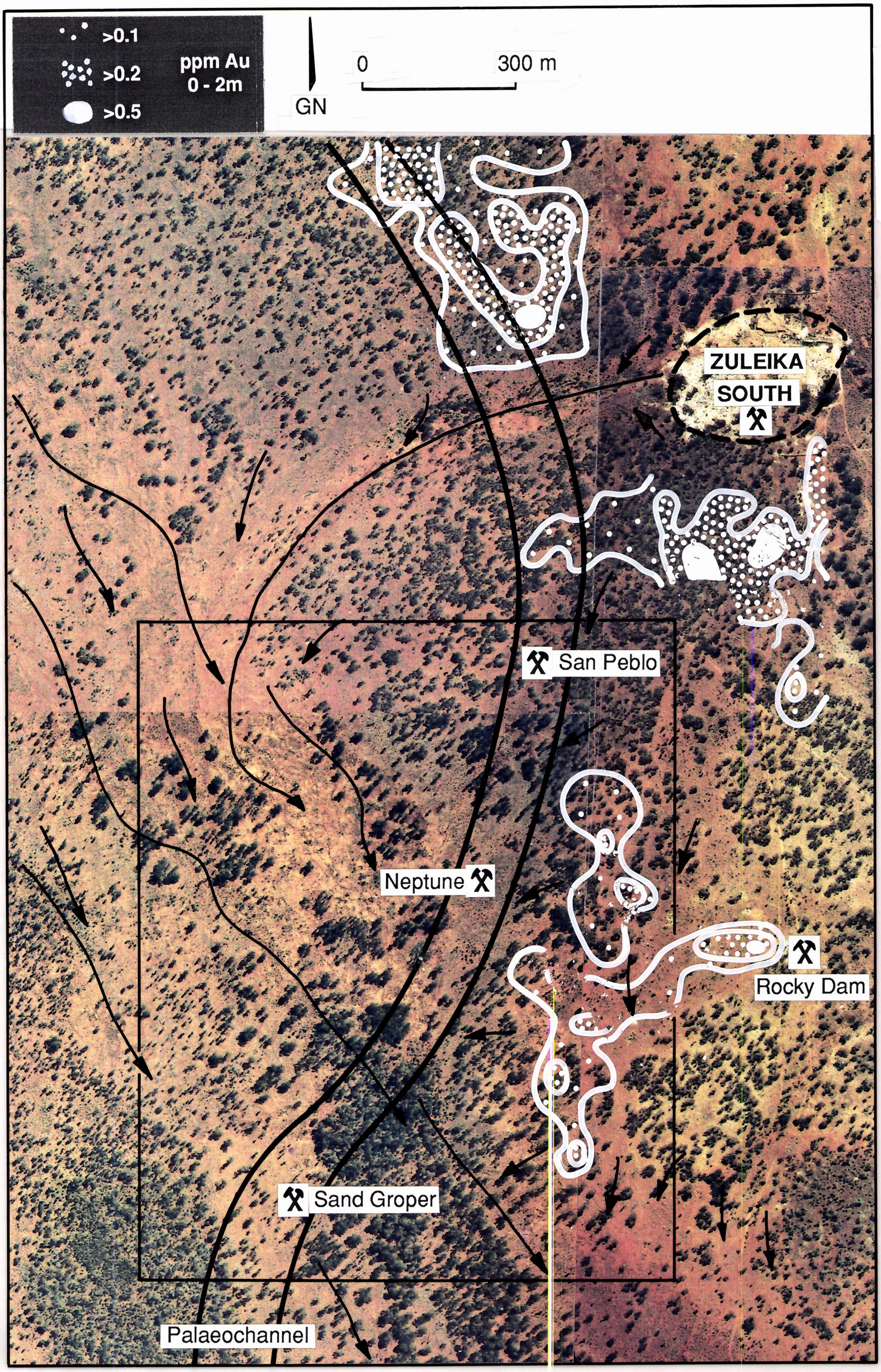
The study area has been divided into three distinct geomorphological zones, with a different soil type associated with each. These are:

(i) Floodplain. This covers the western and central portion of the study area and continues to the west as a broad valley that receives run-off and flows only after heavy rainfall. The valley is a choked remnant of a drainage system which was once considerably more active under a higher rainfall regime than that which is apparent now. The landscape model category is classified as C 0 Ca [3] (Chapter I.1, Butt and Zeegers, 1992) i.e. fully truncated, minor recent alteration, recent Ca carbonate accumulation, transported.
(ii) Subdued spur. This is an elevated strip of land that divides the floodplain from the residual pediplain (model B 0 Ca [1], i.e. partly truncated, minor recent alteration, recent Ca carbonate accumulation, residual).
(iii) Residual pediplain. This occurs in the eastern portion of the study area and extends further to the east (model B 0 Ca 2, i.e. as for above but semi-residual).

The study area approximately centres on the palaeochannel which, in turn, occurs beneath the present floodplain (Figure 3).

Vegetation. Vegetation is typical of the Coolgardie Botanical District and is comprised of open woodland with some closed woodland. The floodplain has patchily distributed *Eucalyptus salmonophloia* (salmon gum), with specimens occasionally over 15 m in height, and other eucalypts less than 15 m. The groundcover is comprised mainly of chenopod (saltbush) shrubs e.g. *Maireana* sp. (bluebush) of less than 0.5 m. A thickly vegetated area of closed woodland of several hundred metres length and breadth occurs towards the south of the study area on 4200N; it consists of *E. salmonophloia*, *E. salubris* (gimlet), *Acacia* spp. (mulga), and *Casuarina* spp. (sheoak). This area is a topographic low where run-off probably collects and remains for longer periods when compared with the surrounding floodplain. The inferred abundance of soil water enables the development of a larger vegetative biomass. The ground is covered by considerable quantities of mull ranging from decaying leaves and branches to whole trees.

Figure 2 (overpage). Aerial photograph with overlay of the study area showing the Zuleika Sands deposits. Aerial photograph 5783/2, 5777/1, 5785/2 - 7.7.85, Aerial Surveys Australia, published with permission of Centaur Mining and Exploration Limited.


>0.1
>0.2
>0.5
ppm Au
0 - 2m
GN
0
300 m
ZULEIKA
SOUTH
San Peblo
Neptune
Rocky Dam
Sand Groper
Palaeochannel

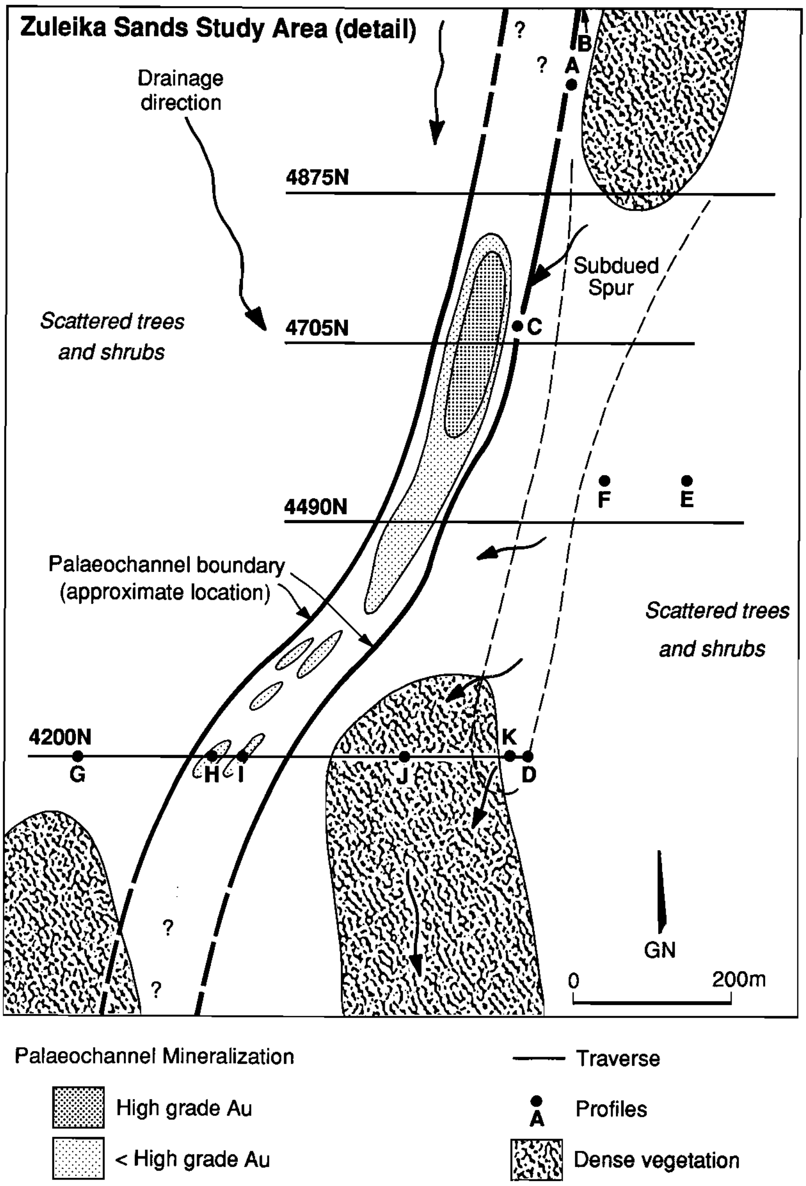


Figure 3. The study area showing the location of the palaeochannel, the soil types, the soil pits and traverse locations.

The subdued spur and the adjacent flanks are moderately vegetated and support *E. lesouefii* (goldfields blackbutt) with a sparse groundcover of *Maireana* spp. The trees do not exceed 10 m in height. The occurrence of *E. lesouefii* has been taken by others (Chippendale, 1973; Beard, 1990) to indicate the presence of underlying ultrabasic rocks. Weathered ultramafic sediments have been identified from drill cuttings in the adjacent channel.

The pediplain is dominated by shrubs of *Maireana* spp. with occasional small groups of *E. salmonophloia* and *E. lesouefii*.

Landscape. Surface features of the floodplain include some cracking clay and weak gilgai development, which are suggestive of a poorly drained and occasionally waterlogged area. Scattered gravel-sized ferruginous nodules and quartz pebbles occur over the floodplain surface. The surface is poorly drained but there are discrete but discontinuous stream channels present with a NW-SE orientation. The relief is less than 2 m from 4875N to 4450N. The floodplain continues for several hundred metres to the west and for several kilometres to the north-west. Drainage ultimately ends in Black Flag and White Flag Lakes, about 15 km to the south east.

The floodplain is partly bound on its eastern flank by the subdued spur of approximately 2 to 3 m relief relative to the floodplain. Examples of incipient rill erosion on the western flank of the subdued spur do occur but they are rare. The gradient is less severe on the eastern flank. The subdued spur is less prominent to the north where the relief tends to be more uniform across the three zones. Soils are composed of ferruginous, siliceous and carbonate-rich nodular material with examples of the latter occurring as detritus on the surface. To the east of the spur, the pediplain continues to rise at a gentle gradient. It is relatively gravel-free and devoid of stream channels.

Soils. The soils of the floodplain have been studied in the most detail. They are predominantly red to red-brown clay, ranging in texture from sandy-silty in the top-soil (0 - 10 cm) to uniform platy-blocky clay in the sub-soils. Within the top two metres, there are one or more distinct sedimentary lenses, each a few centimetres in thickness, consisting of rounded (transported) ferruginous gravels and other material (e.g., quartz, basalt). Modification of the top metre (at least) of the sub-soils has taken place to varying degrees by recently-deposited carbonate. The carbonate takes on the form of powdery coatings (<1 mm thick) on soil particles and, where the sub-soil is indurated, as precipitates on partings (>1 mm thick). Denser pockets of carbonate do occur and can be spatially related to the sedimentary, ferruginous gravel horizons. In addition, within the first five metres of the profile, there are indurated (lateritized) horizons consisting of hard, homogenous clay and ferruginous segregations. A prominent feature of the sub-surface clays (2 - 5 m) is the presence of dark grey-green and some paler mottling. This suggests the clay is partially reduced and indicates that percolating rainwater has been de-oxygenated, possibly by respiration of micro-organisms. Detailed descriptions of the soil profiles are found in the Appendix.

The soils of the subdued spur are comprised of a heterogeneous mix of residual sands, silts and gravels that grade into saprolite within the top two metres. Soils are pale coloured and have been highly modified by carbonate which commonly occurs as large indurated nodules. There is a considerable segregation of the sub-soil which is comprised of ferruginous and siliceous nodules and fragments.

The soils of the pediplain consist of a sandy top-soil and a brown clay-rich loam sub-soil. The top metre has been modified by introduced carbonate that occurs as coatings on, and soft segregations within, the clay. The soil grades into ferruginous segregations similar to those in the sub-soils of subdued spur which suggest the two soils have similar origins.

Stratigraphy and lithology. The palaeochannel runs approximately parallel to the regional strike in the vicinity of the Zuleika Sands deposit. The thalweg is situated between 15 and 20 m below the present land surface. The subdued spur marks the western limit of the residual regolith, and a simple projection to the thalweg indicates that palaeochannel has a very steep eastern "bank". The palaeochannel is infilled by sands and clays that have been weathered since deposition (Figure 4). A typical section consists of :

0-2 m	Calcareous soils, colluvial gravels and homogeneous red clays
2-9 m	Mottled clay with mottles increasing in size with depth; with patchy indurated, Fe-rich segregations
9-13 m	Pale clays with sandy silt
13-17 m	Iron stained clays with silty sand (with some cementation by clays); gravel and boulder sized angular quartz rubble often with manganese staining; localised massive calcrete pod.
>17 m	Saprolite-grading to saprock then bedrock

The depth of the sediments covering the basal sand varies, but in general increases towards the south. The base of the channel is at a mean RL 370 m along section 4875N (Figure 3), reducing to below 363 m along 4450N. The gradient is far steeper than the current land surface and suggests that the energy level of flowing surface water was considerably greater in the past than the present. This is corroborated by the angular quartz gravels and boulders found at the base of the channel. Several lithological units, including weathered felsic mafic and ultramafic rocks and shales subcrop beneath the channel sediments.

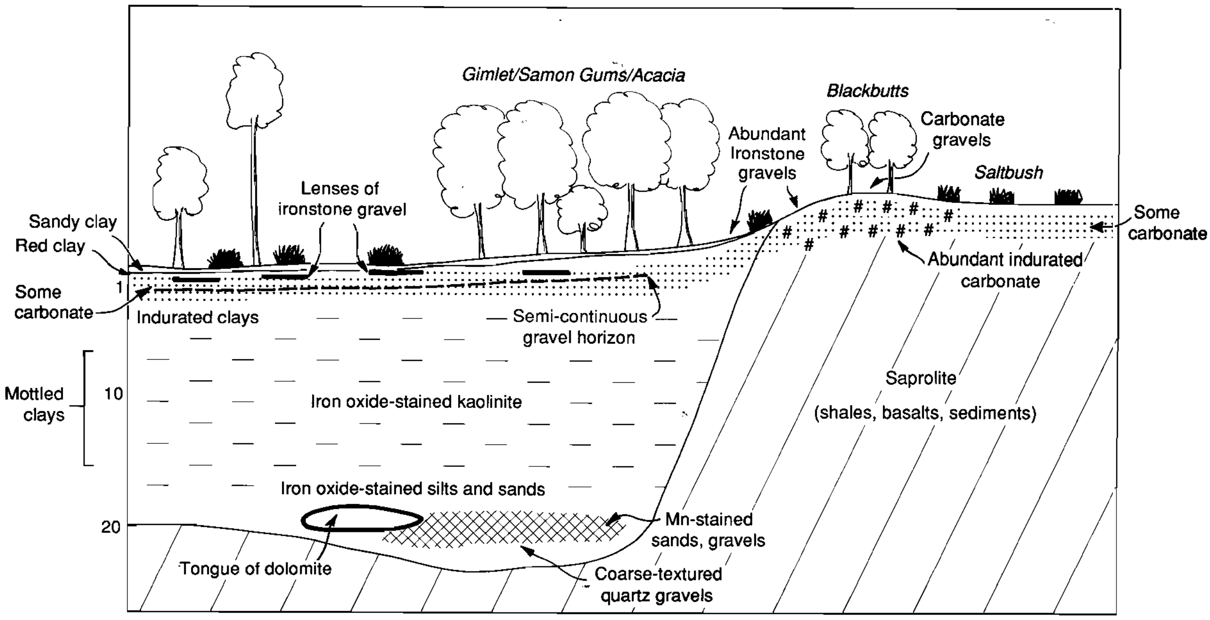


Figure 4. Typical section through the regolith of the floodplain.

Considerable effort was spent by the early geologists describing and recording the general stratigraphy of the sediments filling channels from elsewhere in the Kalgoorlie area. Comparisons of the stratigraphy between alluvial deposits from various palaeochannels (including Zuleika Sands) indicates a high degree of similarity which suggests that the channels were filled, and Au deposits formed, under similar environmental conditions. A typical description from Kanowna is quoted below from Gibb Maitland (1919):

> *"The deposits filling the old watercourse naturally vary somewhat in different portions; they consist first of a variable thickness of surface loam, etc., succeeded by ironstone gravels, partially cemented in places by kaolin and oxide of iron into solid rock; beneath this lies a bed or beds of practically pure kaolin ... and a varying thickness of pebbly quartz-wash. The wash contains rounded or sub-angular pebbles of quartz, which in the upper portion of the deposit is often associated with kaolin and sand. This wash is cemented by secondary silica into a hard compact rock which, in hand specimens, might easily be mistaken for quartzite."*

Recently, Commander *et al* (1992) described a series of sections through the Roe Palaeodrainage in the Kalgoorlie area; the Zuleika Sands deposits are located in the upper Black Flag tributary of the Roe Palaeodrainage. They suggest that the valley bottoms are generally V-shaped and that subsequent lateral erosion of the valley sides above the Tertiary sediments has occurred. They subdivide the Tertiary sediments into the Wollubar Sandstone and the Perkolilli Shale. The Wollubar Sandstone, found at the base of the channels, consists of grey, buff, yellow, and brown quartz sand, and minor amounts of conglomerate, clay, silt, carbonaceous silt, and lignite. The Wollubar Sandstone which rests unconformably on Archaean rocks, is overlain conformably by the Perkolilli Shale and corresponds to the "sands" horizon (Figure 4). The Shale consists of mottled, grey, dark-red, brown, and yellow clay with minor beds of sandy clay, and may be absent from the upper reaches of the drainage channels; it corresponds to the mottled clay and silt units described above. The Tertiary sediments are overlain by Quartenary sediments. Boundaries between the units may not be distinct.

The age of the sediments has not been established in this study. Lignites from deeper channels (e.g. near Coolgardie, Balme and Churchill, 1959) are Late Eocene. The Wollubar Sandstone has been dated palynologically as late Middle to early Late Eocene (Commander *et al*, 1992). Bunting *et al* (1974) suggested that the absence of clastic sediments younger than Middle Miocene in the Eucla Basin indicates that the palaeodrainages had been filled by sediments, and had largely ceased to flow, by that time. In contrast, the uppermost units include detrital components derived from lateritic regoliths in adjacent higher ground. Sedimentation thus may partly predate, be partly contemporaneous with, and partly post-date the main period of Tertiary deep weathering.

Climate. Ora Banda has short warm winters and long hot dry summers. January is the hottest month (average maximum of 35°C) and July the coldest (average maximum of 16°C). Mean evaporation is about 3000 mm, and monthly evaporation exceeds rainfall for 10 or 11 months of the year. The annual rainfall is about 250 to 300 mm but may vary from 100 mm to 500 mm, with more than half falling during winter. Winter rains consist of light falls associated with the passage of cold fronts whereas summer rains often occur as heavy downpours from thunderstorms, or tropical cyclones that have degenerated into rain-bearing depressions. Individual falls are infrequent and irregularly distributed e.g. a fall of 113 mm was recorded on December 29th 1991 at Ora Banda, whilst only 4 mm fell at Kalgoorlie. The record fall for one day at Ora Banda is 177 mm (February, 1948). No climatic records are available for the study area itself.

4. GEOCHEMICAL RESULTS

Introduction. The main objective is to determine whether there is a near-surface geochemical expression of the channel-related Au deposit. The major difficulty in achieving this objective is to be satisfied that any such expression is discrete and distinguishable from anomalies derived from other sources. Of major concern is the effect of natural contamination from outcropping mineralization in residual areas upslope. Some contamination must occur since, during the study, considerable quantities of run-off and associated sheetwash sediments were observed draining westward from the mineralization on the subdued spur into the floodplain. Near-surface Au anomalies associated with the residual soils had been outlined by a vacuum drilling programme (50 m x 50 m grid) undertaken prior to this study (Figure 2). Further possible surface contaminations could occur from upstream via tributaries draining nearby mines (including Zuleika South). Considered in retrospect, the area does not represent an ideal study site because of the possibility of this equivocal interpretation. Nevertheless, it does represent a case study with the problem of having to distinguish and interpret single or multiple anomalies.

Sampling. High quality surface samples were obtained by reverse circulation (RC) drilling to 5 m depth. The drill holes were spaced at 10 m intervals on four widely separated traverses and samples collected at 1 m intervals down to 5 m. Minor (<5 m) deviations from the traverses was forced on a few occasions by the presence of uncleared vegetation. The drilling was strictly supervised to ensure considerable care was taken and that drilling was undertaken at undisturbed sites (e.g., away from other drilling, roads, spilled sample bags, etc.).

The traverse sites were chosen to (i) ensure adequate coverage of the main palaeochannel deposit, (ii) allow for interference, as much as possible, from other soil anomalies and (iii) relate any variation in surface anomaly tenor to different grades of mineralization in the palaeochannel. The four traverses crossed the floodplain and extended several hundred metres to the east and west. This ensured that any anomaly detected above the palaeochannel was distinct as possible from the other soil anomalies and that sufficient background samples were obtained. The location of the traverses and their attributes (determined from previous drilling results) are summarized below:

1. *Traverse 1, 4875N from 2200E to 2800E (600 m in total)*
Located in low grade mineralization at the southern boundary of the San Peblo zone and the northern boundary of the Neptune zone, with no significant mineralization in lines to the north and south. The eastern edge of the palaeochannel mineralization was estimated to be about 75 m away from the 100 ppb Au isopleth associated with the soil anomaly to the east.

2. *Traverse 2, 4705N from 2200E to 2700E (500 m in total)*
Located above high grade mineralization in the Neptune zone with very significant mineralization in lines to the north and south. The eastern edge of the palaeochannel mineralization was estimated to be about 100 m away from the 100 ppb Au isopleth associated with the soil anomaly to the east.

3. *Traverse 3, 4490N from 2200E to 2750E (550 m in total)*
Located above medium to high grade mineralization between the Neptune and Sandgroper zones, with lines immediately to the north having some significant mineralization. The eastern edge of the palaeochannel mineralization was estimated to be about 100 m away from the 100 ppb Au isopleth associated with the soil anomaly to the east.

4. *Traverse 4, 4200N from 1900E to 2500E (600 m in total)*
Located above low grade mineralization in the Sandgroper zone with little significant mineralization in adjacent lines to the north and south. The eastern edge of the palaeochannel mineralization was estimated to be about 350 m away from the 100 ppb Au isopleth

associated with the soil anomaly to the east. Previous drilling results are limited for this traverse.

Topsoils (0 - 0.01 m) and lags were sampled along the four traverses. Topsoils, including associated lag, were collected at 50 m intervals adjacent to the drill sites along each traverse. Lag samples were taken from traverse 3 (4705N) by sweeping the surface with a dust pan and brush and sieving to retain the 2 - 6 mm fraction.

Vegetation was sampled from two traverses to provide information on the role that trees and plants were having on the re-cycling of elements at the surface. Leaves from eucalypts, branches and leaves from bluebush, and mull from beneath eucalypts were collected; mull is a term used for decaying organic matter (including leaves, bark, branches) collected from the ground.

Soil pits were excavated at several sites to permit detailed examination of the soil profiles and to determine more precisely the host horizon(s) and/or minerals associated with anomalies of Au or other elements.

4.1 Traverses: Drilling, Topsoils and Lag

The distributions and associations of elements from selected drill hole (0 - 5 m), topsoil (0 - 0.01 m) and lag (>2mm <6 mm) samples are described below. Not all samples from each drill hole were selected for analysis. Samples were selected according to location, on three zones across each of the four traverses; these are:

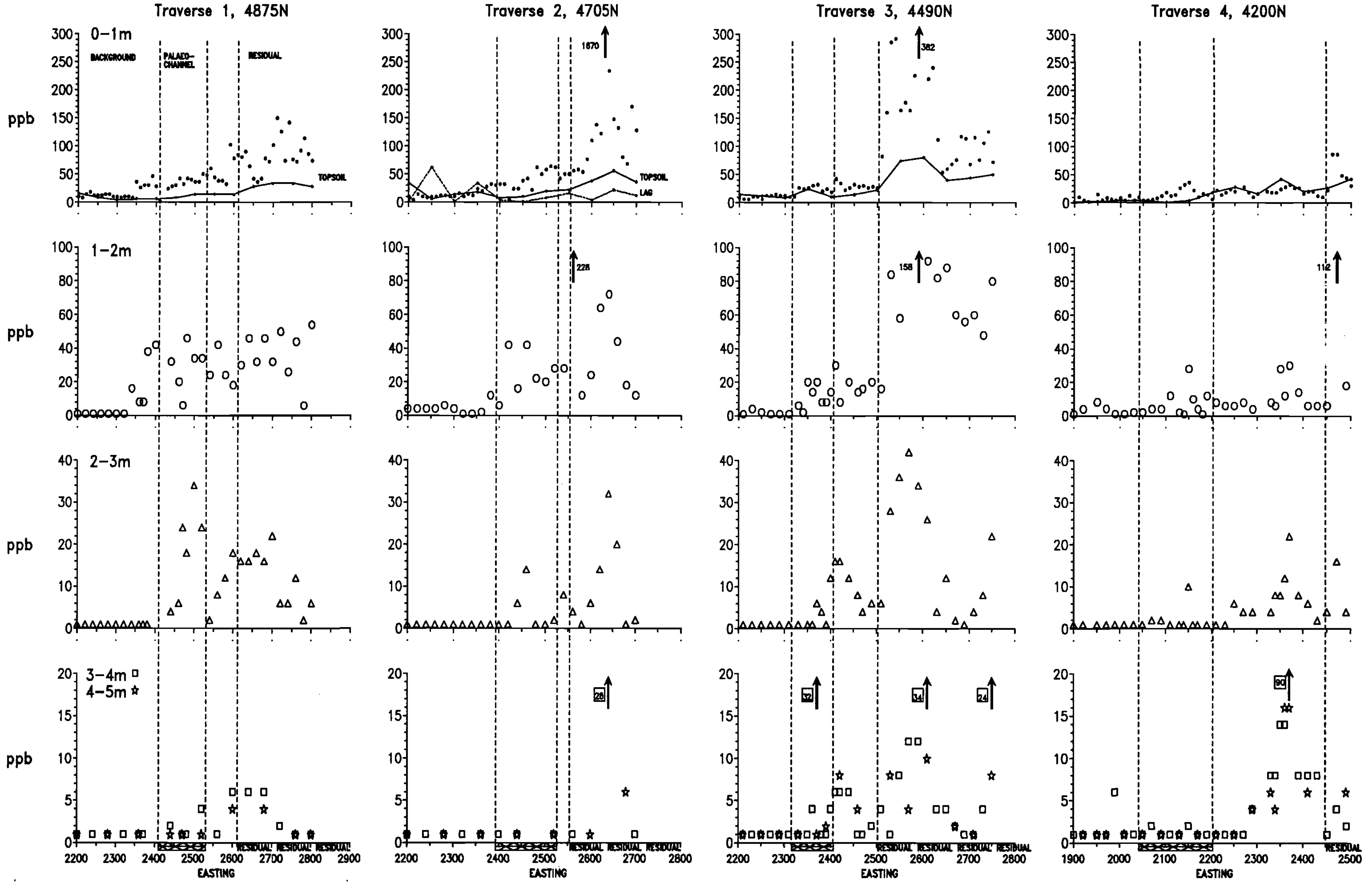
i) *residual* samples include those from the subdued spur and the pediplain;
ii) *floodplain* samples are sub-divided into:
    a) *palaeochannel* samples, which occur directly above the palaeochannel mineralization,
    b) *background* samples, which occur to the west of the palaeochannel sub-set.
    c) *intermediate* samples, which occur between the palaeochannel and residual sub-sets.

The following elements were found to be close to or below their respective detection limits and are not discussed: Ag, Bi, Cd, Cs, Ge, In, Mo, Nb, Sb, Se and W.

4.1.1 Gold

Drill Samples: The most striking feature of the Au distribution in all four traverses (Figure 5a to d) is that most of the Au occurs within the carbonate-rich top metre. Gold abundance decreases sharply below 1 m. This observation is consistent with previous findings in the Southern Yilgarn Block (Lintern, 1989; Lintern *et al* 1991; Lintern and Scott, 1990), in which a close correlation has been identified between Au and pedogenic carbonates. Carbonates at Zuleika occur dominantly in the top 1 - 2 m of the regolith and are most abundant in residual soils.

Figure 5 (overpage): Gold concentrations in the drill hole, soil and lag samples for the four traverses. The approximate location of palaeochannel mineralization is marked by hatching. Residual areas are marked accordingly in the eastern zone of the traverses. Detection limit is 1 ppb.


Traverse 1, 4875N
Traverse 2, 4705N
Traverse 3, 4490N
Traverse 4, 4200N
0-1m
1-2m
2-3m
3-4m
4-5m
ppb
BACKGROUND
PALAEO-CHANNEL
RESIDUAL
TOPSOIL
LAG
1670
382
228
158
112
28
12
34
24
90
EASTING

The highest Au concentrations are found associated with the residual soils (Figure 5). Gold concentrations in the top metre range from 30 ppb to 1670 ppb and are commonly in excess of 100 ppb (Table 1). The anomaly associated with the residual soils is expressed in all traverses but is particularly significant on 4490N and 4705N. The highest Au concentration (1670 ppb) was recorded in the 0-1 m sample at 2630E 4705N. The lowest Au concentrations (0-1 m) are from the background zone at the western ends of the traverses. Comparison of Au - Ca data suggest that there is a weak to moderate association, which appears stronger in the soils of the floodplain (Figure 6). The variability of the Au and Ca data is greatest in the residual soils which reflects their heterogeneity.

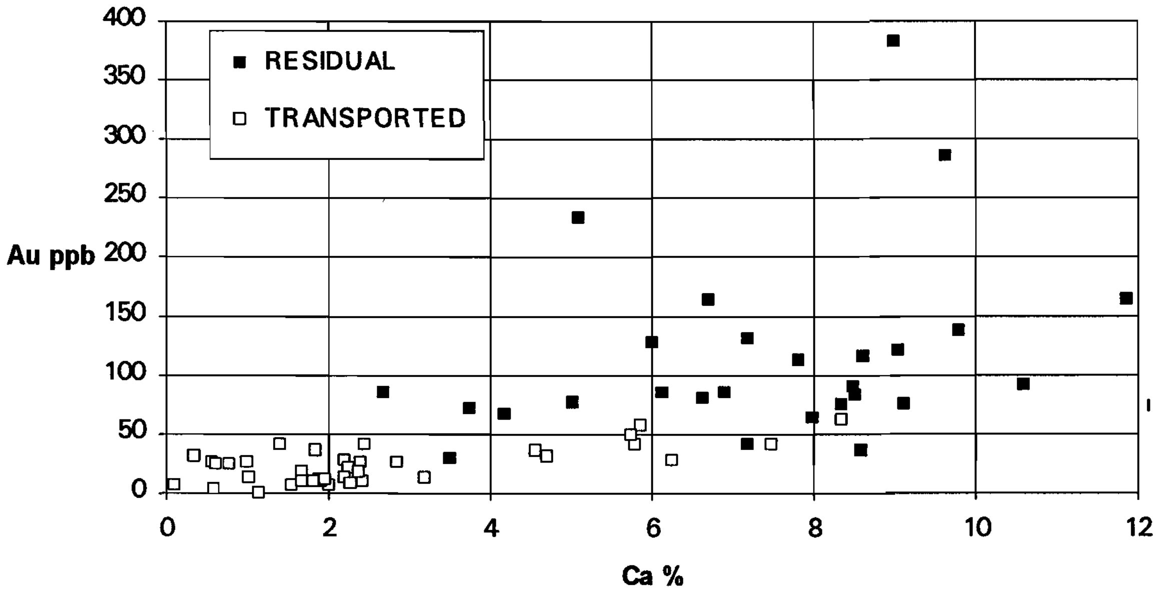
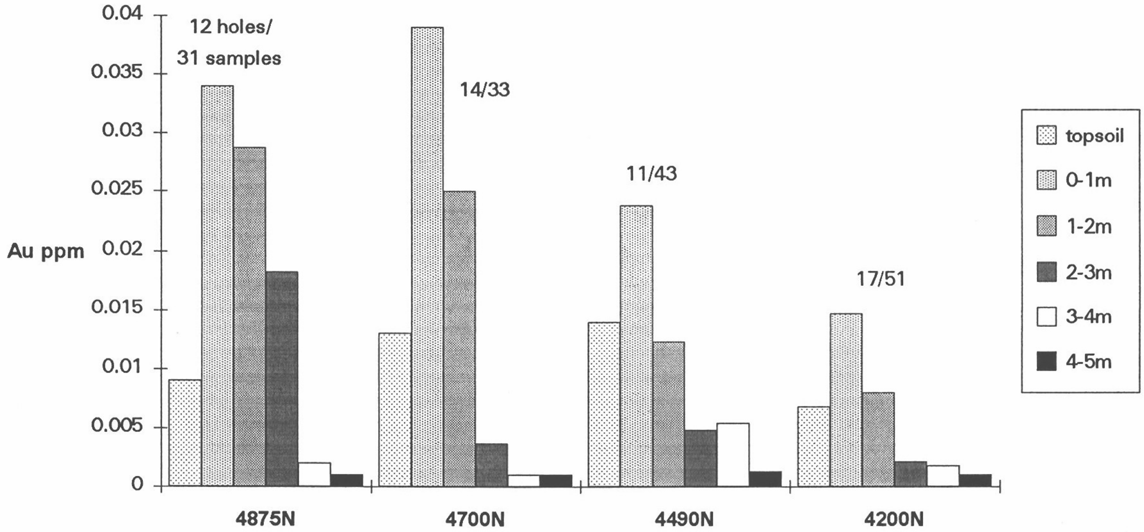


Figure 6: Comparison of Ca and Au (<400 ppb) in the 0 - 1 m sample in soils developed on residual and transported substrates.

Examination of the data for the floodplain on each traverse suggest there are anomalously high, and statistically highly significant, Au concentrations in the top metre over the palaeochannel compared to background samples to the west. Gold concentrations (0 - 1 m) directly above the palaeochannel range from 1 ppb to 64 ppb (mean 28) compared to the background of 1 - 46 ppb (mean 13) (Table 1). However, in the two northern traverses, at least, the proximity of the palaeochannel to the anomaly in the residual soils of the spur suggests the possibility of downslope contamination. In the two southern traverses, where the palaeochannel is located further west (up to 250 m in traverse 4) of the subdued spur, the anomaly over the spur appears to be discrete and ends abruptly at the beginning of the floodplain. Nevertheless, there is no significant difference in Au concentration at 0 - 1 m between floodplain soils over the palaeochannel and those in the intermediate zone between the palaeochannel and the residuum.

Thus, there is no unequivocal evidence that Au mineralization at the base of the palaeochannel is indicated by an immediately superjacent surface anomaly. Similarly, those anomalies that are present do not reflect the gold distribution of the underlying mineralization because the grade-thickness product of mineralization on traverse 1 (4875N) is the lowest of all the traverses yet soil Au content above is the greatest (Figure 7). The highest grade-thickness product occurs on 4490N, but the Au abundance in the soil ranks only third. Inspection of the data suggests that the soil anomalies do not appear to be displaced down drainage.

a)



b)

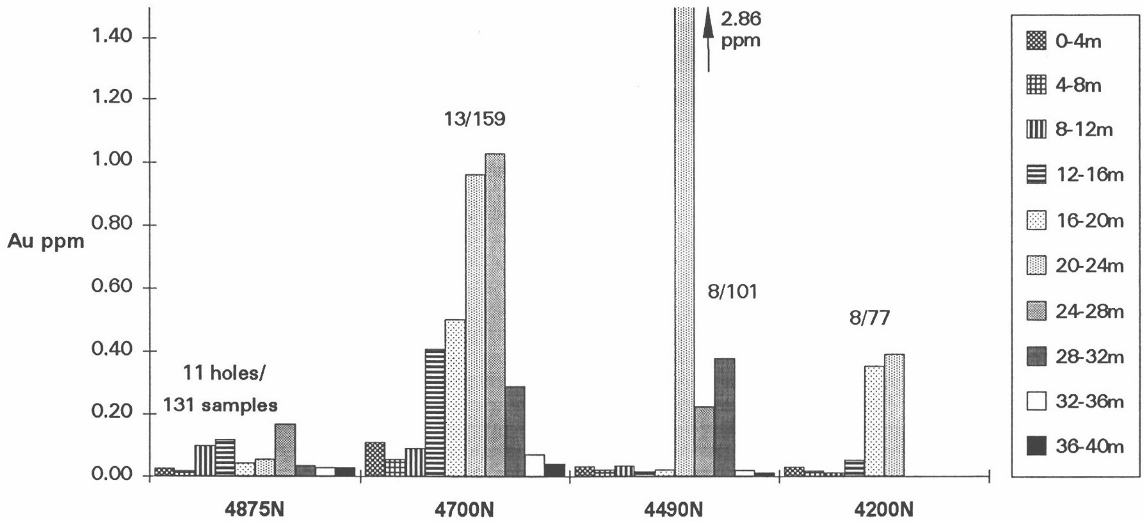


Figure 7. Gold concentrations in (a) soils and (b) deeper in the regolith in the vicinity of the palaeochannel. Data have been averaged for the thickness indicated in the legend.

Table 1 : Elementary statistics for the 0 - 1 m Au samples.
N = number of observations, Min. = minimum, Max. = maximum, S.D. = standard deviation, C.V = coefficient of variation, Med = median.

Subset	N	Min.	Max.	A.M.	S.D.	C.V.	Med	Mode
Residual	64	30	1672	141	207	1.47	91	76
Floodplain	43	10	102	31	19	1.63	26	26
Intermediate								
Palaeochannel	48	1	64	28	15	1.80	26	32
Background	66	1	46	13	1.1	1.53	10	10

Topsoils and Lag. The topsoil data indicate that Au is most abundant in the residual soils, particularly on the subdued spur. The Au contents are lower but less variable than those in the 0 - 1 m samples and generally correlate well with them except in the wooded section on 4200N where topsoils have higher Au content. Gold concentrations in the topsoil tend to decline steadily from east to west, with no increase over the palaeochannel mineralization. The data indicate dispersion from the topographically higher residual soils to the lower floodplain soils.

The lag data (4705N) are much more variable than the drill hole and topsoil data. The highest Au contents occur in the floodplain and represent alluvial/colluvial deposition as either discrete Au grains or inclusions within the lag, probably derived from the north. One implication of this result is that any Au enrichment within soils on the floodplains, whether over the palaeochannel or in the background, could be interpreted as having been dissolved and reprecipitated from the lag.

Summary. The drilling data neither support nor repudiate the hypothesis that Au enrichment in the near-surface is related to Au mineralization deeper in the regolith, concealed by transported overburden. There is no doubt that the Au contents of soils from the floodplain above the palaeochannel are higher than those in background areas to the west, but they are not sufficiently distinct from the floodplain immediately to the east for the possibility of contamination from residual soils to be discounted. In addition, the poor association between the tenor of mineralization in the palaeochannel and that of the soil above it suggests that there is no relation between the two sets of data. The topsoil and lag data similarly suggest that contamination of the floodplain soils by residual soils may have occurred. The distribution of other elements has been investigated in part to determine whether such contamination can be recognized.

4.1.2 Major and Trace Elements

Elements are grouped according to their geochemical affinities. The results are tabulated and graphed in the Appendix.

Aluminium and Gallium. The geochemistry of Ga is closely related to that of Al as they have similar trivalent ionic radii. Aluminium is a major component of soils and principally occurs in clay minerals such as kaolinite and smectite. The mineralogy analysis of the drill samples shows that kaolinite is abundant whereas little smectite was detected.

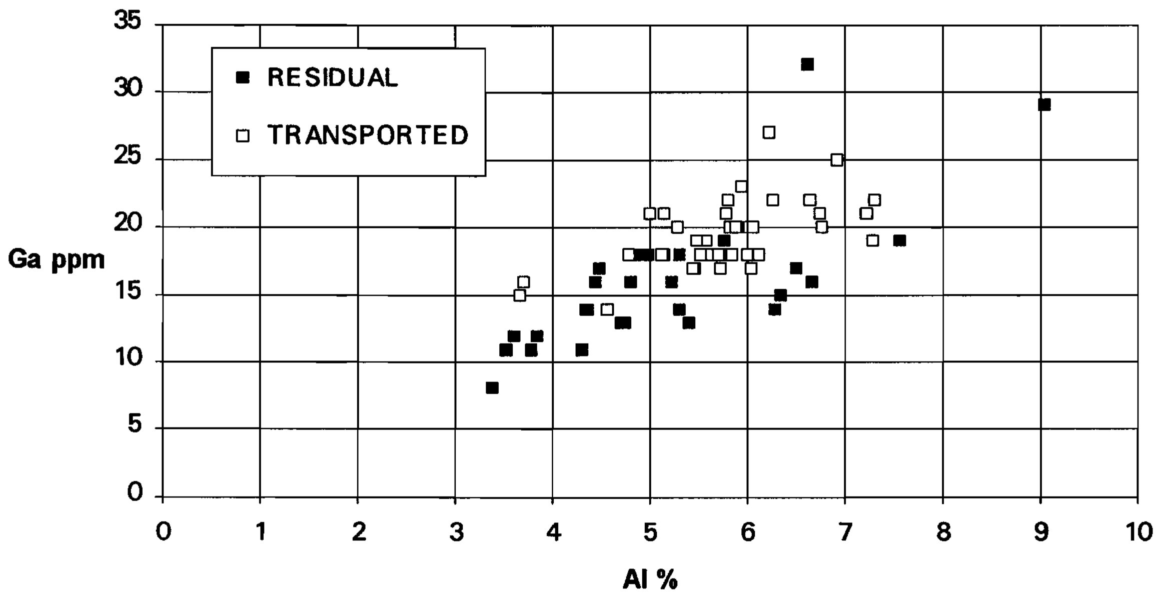


Figure 8: Comparison of Al and Ga in the 0 - 1 m sample in soils developed on residual and transported substrates.

The concentrations of Al and Ga in the 0 - 1m samples tend to be greater in soils on the floodplain than those developed on residuum. A constant Al:Ga ratio is maintained (Figure 8) although mean concentrations of Al are not statistically significant between residual (5.22 %), palaeochannel (5.93 %) and background (5.52 %) samples. This similarity is surprising for a major element considering the major textural differences in the soil types. Aluminium content is generally similar to that found in the calcareous soil at Mt. Hope and Panglo. Mean Ga concentrations varied from 17 to 23 ppm, which are similar to soils from Panglo; but much lower than those in the lateritic duricrust at Mt. Percy (75 ppm, Butt, 1991); gallium was not determined at Mt. Hope. Concentrations tend to increase with depth in all soils, reflecting the increased abundance of kaolinite with depth although some Al is likely to be present as a substitute for Fe in hematite and goethite. Deeper samples have a greater Al:Ga ratio which suggests a difference in chemical mobility, i.e. Ga is more mobile, or Al less mobile, in reducing conditions.

The Al distribution in topsoils closely follows that of the 0 - 1 m samples and shows little variation across the four traverses. Concentrations are generally similar to or slightly lower than the 0 - 1 m samples, reflecting dilution of the topsoil by sand. Concentrations in lag (4705N) tend to be greater in residual soils, but are lower than in the soil and drill samples, and reflect a low clay content and/or Al substitution in Fe oxides. It was suggested that the large Ga concentrations at Mt. Percy in the lateritic duricrusts were due to preferential retention within recrystallizing Fe oxides or due to retention in resistate minerals (Butt, 1991). Aluminium is significantly correlated with Ti, Ga, Rb and Zr.

Silicon. Silicon occurs principally in quartz and kaolinite in the soils and upper regolith. Mean Si concentrations are significantly lower in residual soils (12.8 %) compared to floodplain soils (23.0 %). Higher Si concentration in the latter can be mostly explained by their greater quartz content since Al concentrations are similar (Figure 9). Concentrations of Si tend to decrease with depth in the floodplain soils as the texture changes from sand-rich to clay-rich, and with decreased quartz abundance. In the residual soils, Si contents tend to increase with depth reflecting the siliceous nature of the soils. Titanium, Ce, La, Nb, Nd, Pb, Rb, Y, Zn and Zr are significantly correlated with Si.

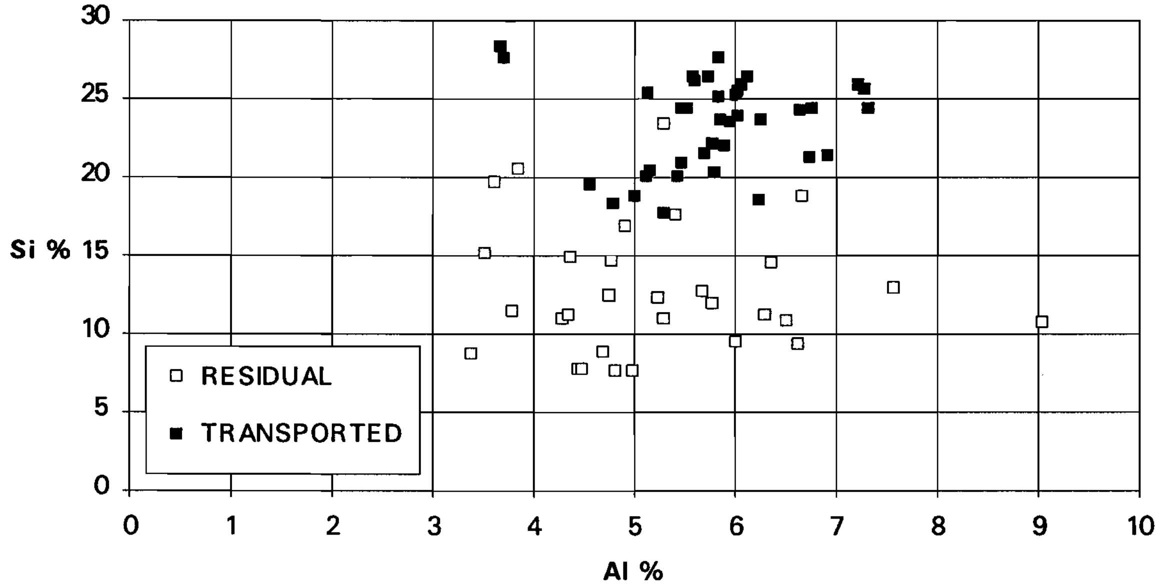


Figure 9: Comparison of Al and Si in the 0 - 1 m sample in soils developed on residual and transported substrates.

Topsoil Si concentrations are generally higher than for the drill samples and reflect surficial enrichment by sand of aeolian and fluvial origin. Silicon contents tend to be lower in soils in residual areas than those in the floodplain.

The Si content of lag is lower than in either topsoil or drill samples but has a similar distribution. Silicon contents are greatest in the floodplain and reflect the physical accumulations of coarse detrital quartz gravels, presumably shed from outcropping veins located upstream.

Iron, Vanadium, Chromium, Arsenic. Iron is a major component of ferruginous lag, lateritic gravels and clay coatings, in which it occurs as oxides and oxy-hydroxides, principally hematite and goethite. At Zuleika, mean concentrations of Fe differ significantly between residual-background (18.4 - 18.7 %) samples and palaeochannel (13.5 %) samples. Higher Fe concentrations within the floodplain are associated with deep red-brown indurated horizons (observed during drilling) and are especially prominent below the first metre. Here, the Fe oxide minerals have accumulated at particular sites that may be related to localized sub-surface aquifers and precipitation zones. In other floodplain areas, softer, moist, drill samples from below the top metre were commonly grey or grey-green but, on exposure to the air, rapidly became by pale red to brown colours i.e. Fe^{2+} is being oxidized to Fe^{3+}. These reducing conditions are caused by impeded drainage and respiration by micro-organisms and plant roots. Iron is readily mobilized as Fe^{2+} under such conditions. Grey colours and soil moisture were not present in samples from the ridge suggesting that internal drainage is better developed here. Arsenic, Cr, Cu, Ga, Sc and V are significantly correlated with Fe.

The Fe contents of the topsoils are generally lower than in the 0 - 1 m drill samples. The distribution of Fe in the topsoil is similar to that for the drill samples although the data are more variable. The higher Fe concentration of topsoils on the western edge of the spur reflects the greater proportion of ferruginous lag.

Lags are strongly enriched in Fe, with Fe content being higher on the spur and lowest in the floodplain where detrital quartz is more abundant. Localised accumulations of ferruginous lag occur throughout the floodplain.

Vanadium, Cr and As are strongly positively correlated with Fe (Figures 10 a, b and c). The association is strongest for V. The ratio Fe:V of 400:1 is similar for drill cuttings, soil and lag samples and is lower than that found in soils at Mt. Hope (700:1, Lintern *et al*, 1989). The similarity of the ratio over a wide area is a striking feature of the behaviour of V both at Mt. Hope and Zuleika. It suggests that (i) any mobile V is quickly adsorbed by Fe oxides at source, (ii) there are limited sites for its adsorption and/or (iii) there is little movement of free vanadium ions (usually $(VO_4)^{3-}$) within the soil profile. The constant value of the ratio indicates that it cannot be used as a lithological discriminator. The high Cr content suggests the soils are predominantly of ultramafic origin (Hallberg, 1984), although if this is true, Ni content (mean of 222 ppm) is unusually low. Although partially weathered lithofragments in the transported material are of basaltic origin. The Fe:Cr ratio is significantly higher in floodplain soils (125:1) than residual soils (60:1) due to higher Cr contents in the latter. This suggests that any material derived from the residual soils to the east is diluted by sediments of more distant origin. It is unlikely that there has been preferential leaching of Cr from the floodplain soils, since the Fe/Cr ratio within this sub-set, as with V, is constant.

Arsenic concentrations and a lower Fe:As ratio are characteristic of the residual soils. The strong correlation between As and Fe contents imply that As cannot be used directly as an indicator for Au in this area since its distribution is strongly determined and controlled by the amount of Fe; the use of As residuals (corrected for Fe content) may be more useful in these circumstances. In summary, residual soils have greater Cr and As than soils on the floodplain, but have similar V contents. This suggests that a significant proportion of floodplain soil has been derived from sediment originating from the north rather than the subdued spur to the east.

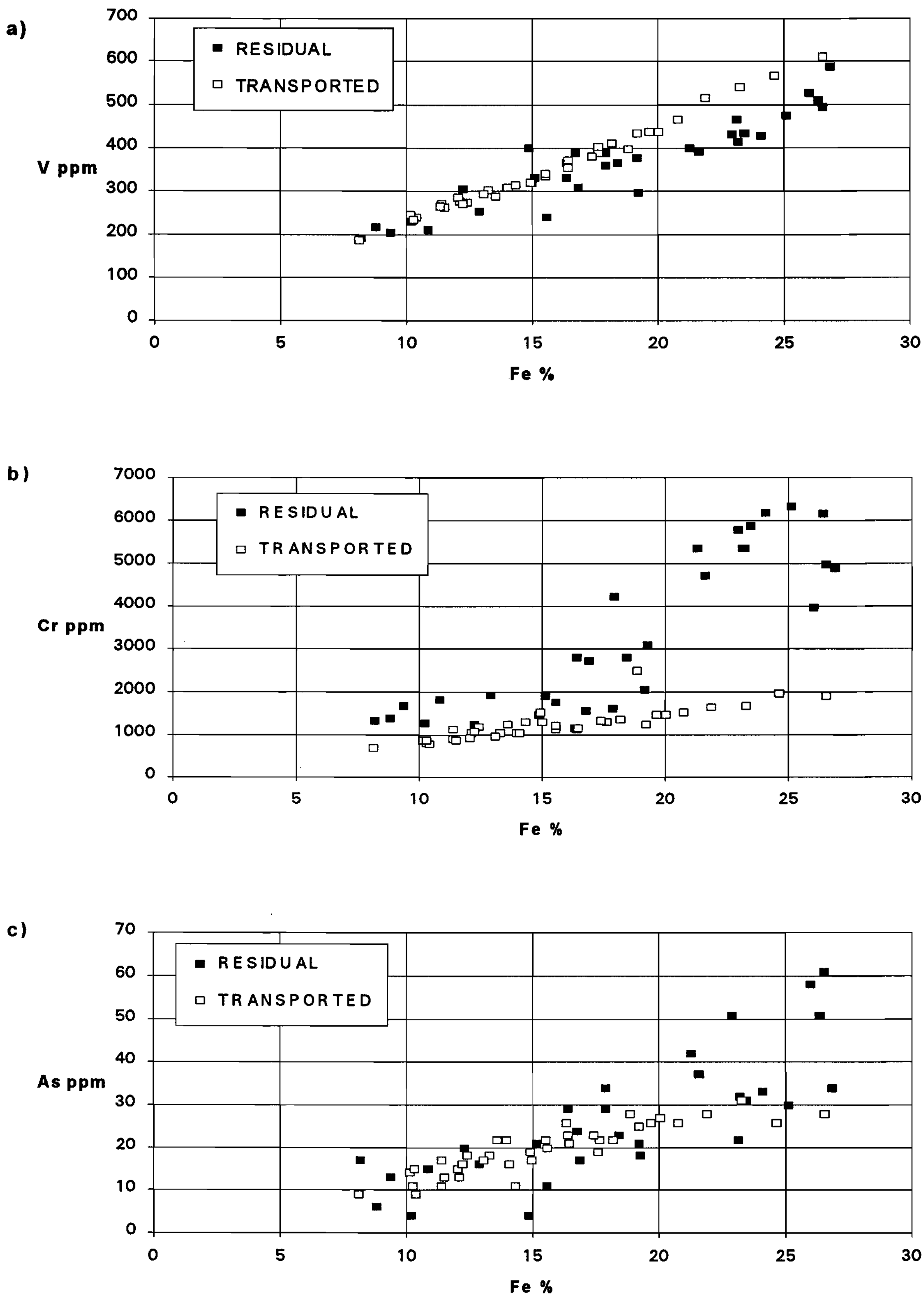
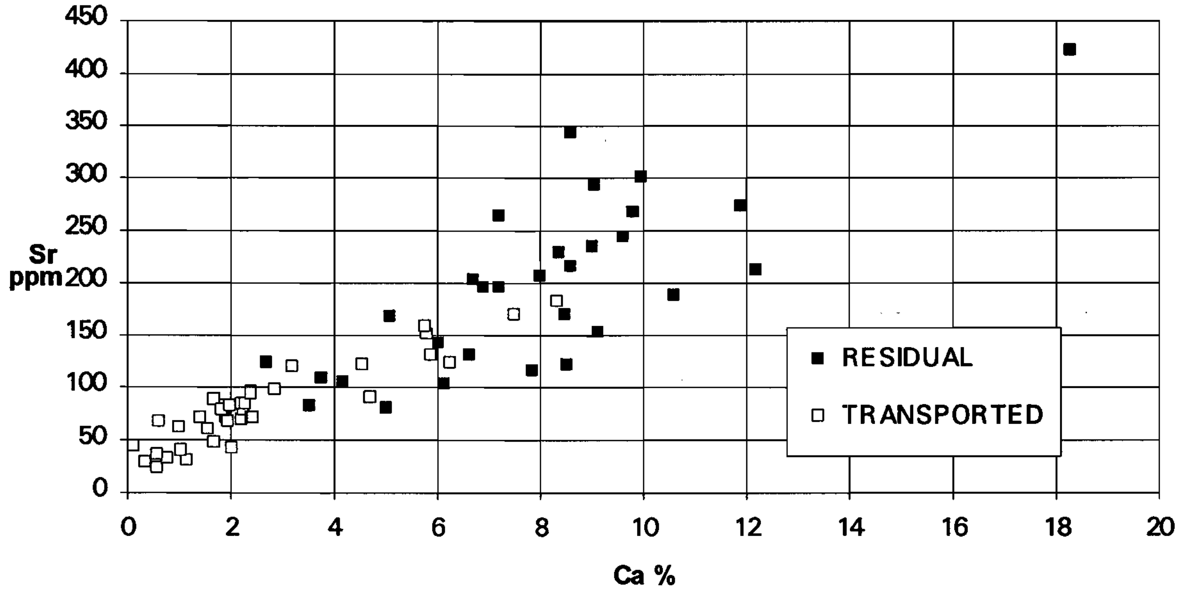


Figure 10: Comparison of Fe with V, Cr and As in the 0 - 1 m sample in soils developed on residual and transported substrates.

Group IIA: Calcium, Magnesium, Strontium and Barium. The alkaline earths Ca, Mg and Sr are strongly concentrated in the top 2 m of the regolith in all geomorphological settings at Zuleika. They are present predominantly as calcite and dolomite, precipitated as pedogenic carbonates. This occurrence is typical of the semi-arid regions of Western Australia south of the Menzies Line. Calcium, Sr and, to a lesser extent, Mg, are very strongly correlated (Figure 11, a and b). The strong association between Sr and Ca is commonly observed in pedogenic carbonates (Lintern, 1989; Lintern and Scott, 1990; Lintern *et al*, 1990) and is probably due to the substitution of Sr at Ca^{2+} structural sites in calcite to form a dilute solid solution; the Sr is, therefore, very strongly bound (Pingitore *et al*, 1992).

Mean concentrations of Ca and Mg differ significantly between the residual (Ca 7.95 %, Mg 2.67 %), background (1.83 %, 0.71 %), and the palaeochannel (2.45 %, 1.17 %) samples. This finding is similar to that found at Mt. Hope, where floodplain soils have lower Ca and Mg content than residual soils. The relatively high Ca and Mg content of the palaeochannel samples suggests that there is a strong localised influence from either adjacent residual soils to the east or from up-slope to the north, with some dilution from transported Ca- and Mg- poor sediments. The Ca:Sr and Ca:Mg ratios are similar for floodplain and residual materials. Calcite, dolomite and some gypsum were found in all soil types particularly in the 0 - 1 m samples; the higher Ca and Mg content of the residual soils is reflected in the presence of abundant calcareous concretions. This is similar to observations made in earlier studies from other parts of the Yilgarn. Additional minor to moderate quantities of Ca and Mg are associated with vermiculite, talc, smectite feldspars and tremolite, and present as inter-layer ions. Calcium and Mg concentrations are markedly greater in all 0 - 1 m samples except in the thickly vegetated part of the floodplain on 4200N which are Ca-rich at 1 - 3 m. The greater depth of carbonate accumulation may be because (i) organic acids are causing greater leaching of the upper horizons, or (ii) this part of the floodplain is more active, and receives more water which ponds for longer periods of time, allowing dissolved alkaline earth metals to percolate deeper in the profile. Magnesium, Sc and Sr are significantly correlated with Ca; Au is significantly correlated with Mg and Ca.

a)



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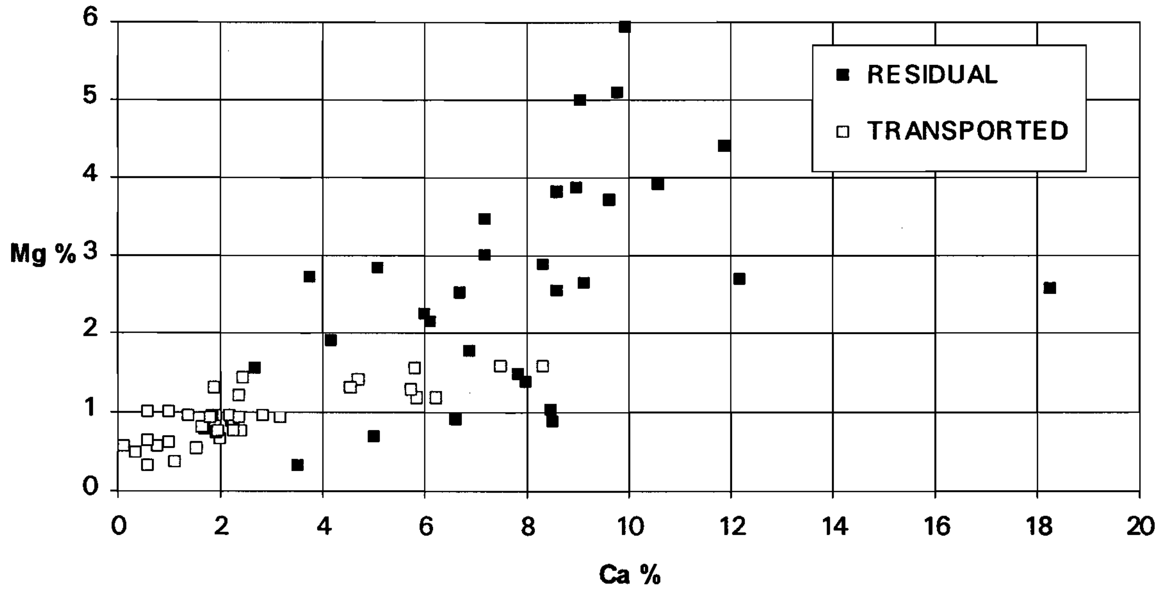


Figure 11: Comparison of Ca with Mg and Sr in the 0 - 1 m sample in soils developed on residual and transported substrates.

Calcium, Mg and Sr contents of topsoils are generally lower than the underlying horizons. However, the areal distribution of Ca, Mg and Sr in topsoil is similar to that for the 0 - 1 m samples, with the highest concentrations present in the residual soils.

Calcium and Mg contents of lag are lower than the drill samples or topsoils, but have a similar areal distribution. Localised accumulations of calcareous lag are a result of insect nesting activity.

Barium does not show any tendency to be enriched within one particular horizon in the drill cuttings and is unrelated to the carbonate distribution. A weak association with K in floodplain soils is indicative of adsorption onto clay particles or substitution in trace amounts of mica. Most Ba is probably present as barite.

Potassium and Rubidium. Potassium is commonly found in minor quantities in soil minerals. It commonly occurs either in muscovite (since this mineral is often preserved in the regolith due to its resistance to weathering), or, once released from the muscovite, in illite or adsorbed to clay minerals, where it readily exchanges with hydrogen (as the hydroxonium ion H_3O^+) probably on account of their similar ionic radii. Other K may be present in relict K-feldspars or as an evaporite mineral. The chemistry of Rb is very closely related to K due to the similarity of the ionic radii which, in turn, permits free interchange of these elements in ionic lattices. In soil, Rb is more firmly held than K both by adsorption and cation exchange (Goldschmidt, 1954).

Mean K concentrations differ significantly between the residual (0.15 %) and floodplain samples (0.36 % for background, and 0.47 % for palaeochannel sub-sets). No specific K-bearing minerals were identified in the samples due to the low abundance. However, as (i) halite was detected in some samples, and (ii) there is a highly significant correlation between K and Na and Cl, it is probable that a proportion of the K occurs as an evaporite mineral. The remaining K, particularly where K contents are high and Na contents are low, is probably adsorbed onto clay or present as illite or remnant muscovite. Potassium data from floodplain sections of 4200N suggests a tendency for K to be more concentrated in the 0 - 1 m samples, whereas elsewhere such a distribution is not evident. Biocycling may be important as K is an essential plant nutrient. Chloride, Na, Mn, P, S, Si, Ti, Ce, La, Nb, Nd, Pb, Rb, Y, Zn and Zr are significantly correlated with K.

Potassium content of topsoil was generally greater than for the drill cuttings. The distribution of K is not smooth and may reflect the presence of detrital, partially-weathered micas. Residual soils have lower K contents than soils on the floodplain.

The K content of lag is low compared with the topsoils and drill cuttings. This suggests that K is mainly associated with the finer fraction within the soil.

The distribution of Rb is strongly related to that of K (Figure 12). The K:Rb mass ratio for all the sample types is approximately 200:1. The maximum Rb concentration (49 ppm) was recorded for a top soil whereas in most lags, Rb contents are close to the detection limit (1 ppm).

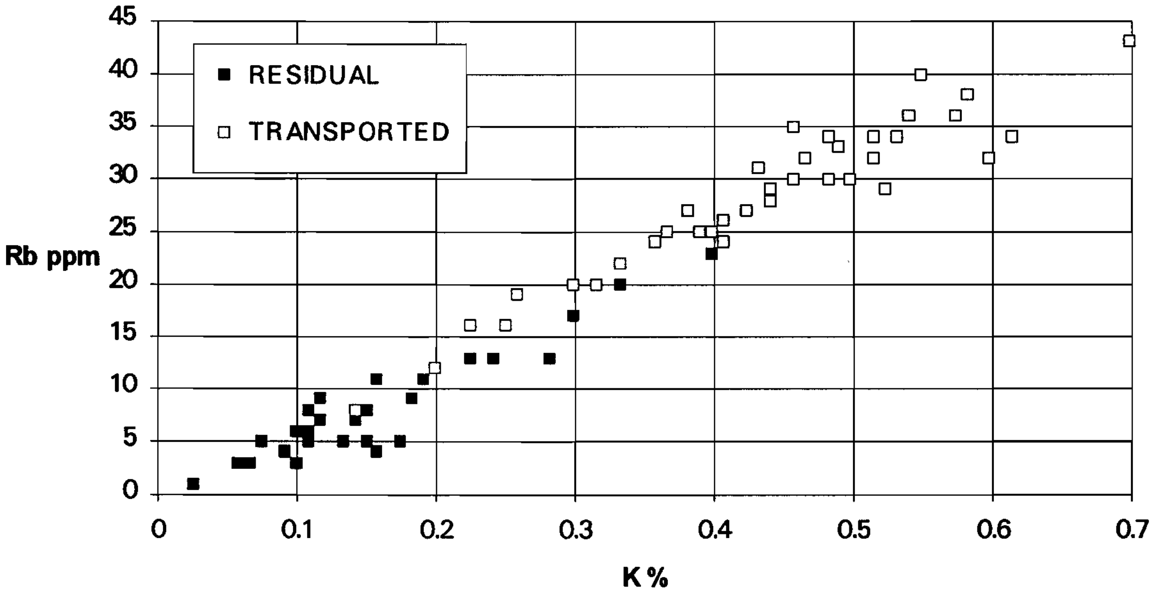


Figure 12: Comparison of K and Rb in the 0 - 1 m sample in soils developed on residual and transported substrates.

Sodium and *Chlorine*. Sodium occurs principally as halite, inter-layer ions and as a cation exchange element in smectites and vermiculites. Chlorine almost certainly occurs as chloride ion and may be also associated with the alkaline earth elements as a non-specific adsorption anion that counters the charge imbalance. Mean Na concentrations differ significantly between the three sub-sets: residual (0.2%), background (0.29%) and palaeochannel (0.43%). Mean Cl concentrations show a similar trend: residual (695 ppm), background (625 ppm) and palaeochannel (1617 ppm). The elements are moderately to strongly associated (Figure 13) and both tend to be concentrated in the 0 - 1 m samples. Sodium and Cl are presumably derived from run-off and sub-surface flow of soil solutions from upslope but the lowest concentrations are generally found on 4200N. The introduction of Na and Cl into the soil from deeper in the regolith is also possible (see Discussion). Phosphorus, K, S, Si, Ti, Ce, La, Nb, Nd, Pb, Rb, Y, Zn and Zr are significantly correlated with Na; K, S, Ce, Co and Rb are significantly correlated with Cl.

Sodium is only a minor component of the topsoil and shows a uniform distribution across the traverses. Salt crusting was not observed on any of the soils but probably develops by capillarity and evaporation during long dry spells, as the moisture content of the soil decreases. Molar Cl concentrations are less than those for Na. Concentrations of both elements are at or below detection limit in lags.

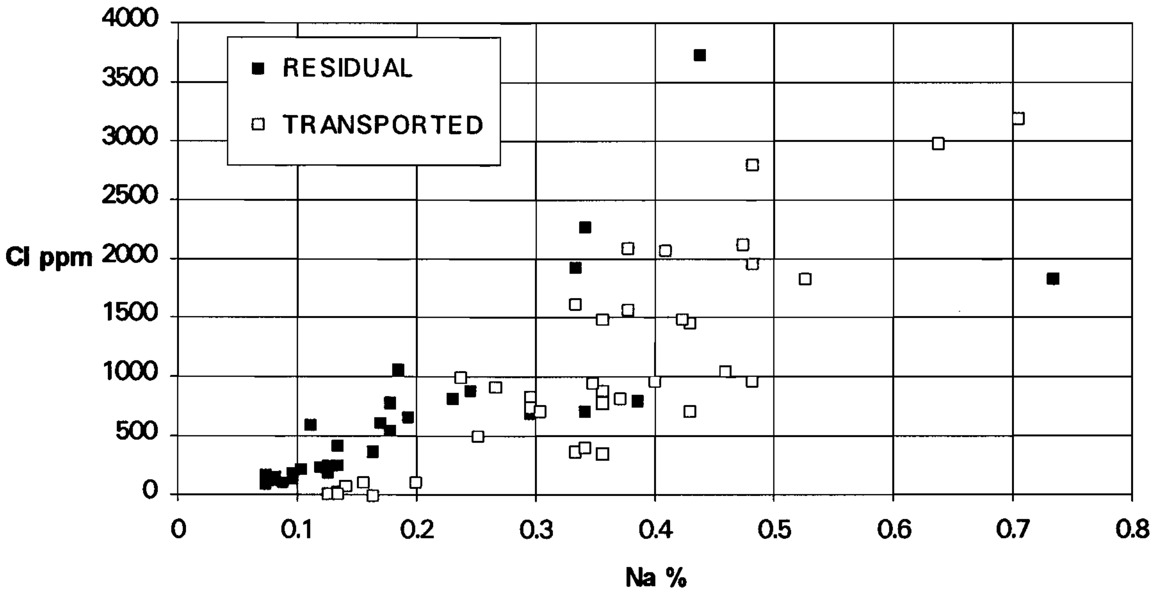


Figure 13: Comparison of Na and Cl in the 0 - 1 m sample in soils developed on residual and transported substrates.

Phosphorus and Manganese. Phosphorus and Mn are both important in plant nutrition, hence their distribution in soils are strongly influenced by biological activity. The mobility of Mn in soil is limited by its precipitation in oxidizing conditions as an insoluble oxide. The oxide can be usually identified in the field by a very dark colouration and can be a site for the accumulation of a variety of trace elements including Cu, Co, Ni, Zn and Pb (Childs, 1975).

The distributions of P and Mn appear to be partly related as they both tend to concentrate in the 0 - 1 m samples and, particularly, the topsoil (Figure 14). This relationship may be due to the abundance of decaying organic matter.

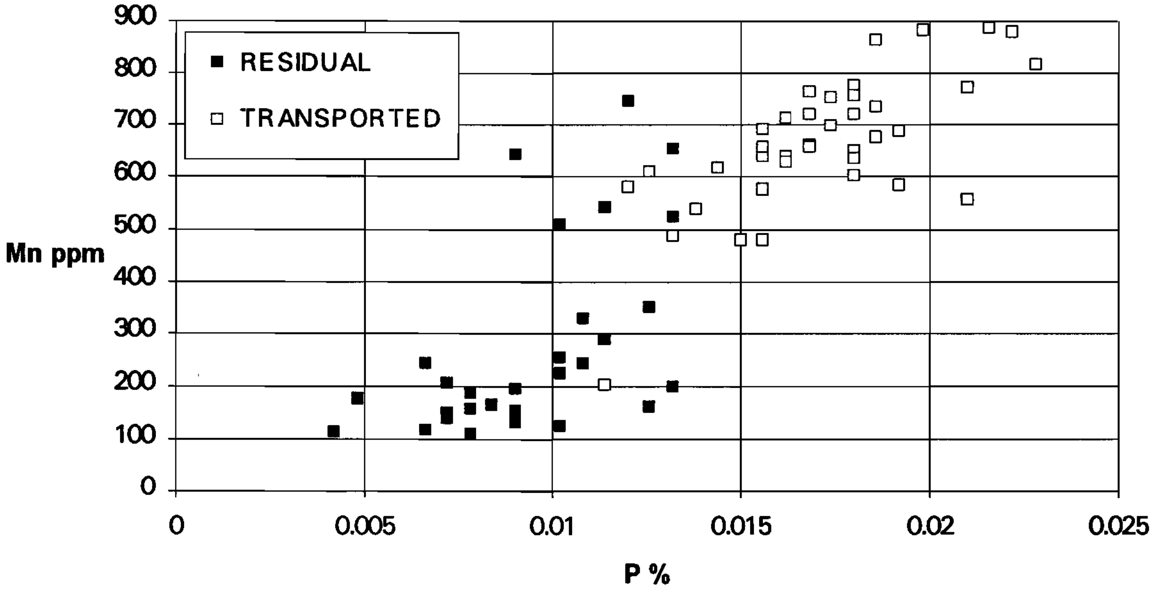


Figure 14: Comparison of P and Mn in the 0 - 1 m sample in soils developed on residual and transported substrates.

Mean concentrations of P differ significantly between residual (0.009%) and floodplain (0.017%) samples. Phosphorus tends to be most concentrated in the 0 - 1 m samples. The P contents are similar to those found in the broad valley landforms of the Edjudina district (Dell *et al*, 1988). As with K, its high concentration in the top metre suggests the importance of a bioaccumulation and recycling process. Potassium, Si, Ti, Ce, Ga, La, Nb, Nd, Pb, Rb, Y, Zn and Zr are significantly correlated with P.

The P content of the topsoil (mean 0.021%) is greater than for the subsoil (mean 0.014%). It is most concentrated in the topsoil of the well vegetated woodland area on 4200N, implying an association with organic material. However, this distribution is not shown by the 0 - 1 m samples, suggesting that P released from mull is either adsorbed on to minerals in the top soil, or quickly taken up by vegetation from biodegradation processes before soil adsorption can take place.

Lag P concentrations follow closely those for the soil samples and demonstrate that P is associated equally with the coarse and fine size fractions.

Manganese concentrations are greatest in the 0 - 1 m drill cuttings over the four traverses, with values ranging from 110 to 746 ppm (mean of 275 ppm) for residual soils to 202 to 887 ppm (mean of 650 ppm) in the floodplain. Manganese concentrations in the topsoil are the greatest for all the media sampled and are particularly high in the woodland area on 4200N (maximum of 1200 ppm) suggesting an association with organic material. Lag Mn concentrations are generally lower than in the soil.

Sulphur. The distribution of S is highly irregular and shows no clear trends either vertically or horizontally. The highest concentration (9000 ppm) is found in residual soils on 4490N whereas the next highest (4000 ppm) is found in floodplain soils on 4875N. Very high S content are probably associated with the occurrence of gypsum, which has been identified in some samples. Chlorine, K, Mn, Na, Ce, Nb, Rb, Y and Zr are significantly correlated with S.

Topsoil S is generally lower than for the subsoils and is fairly evenly distributed across the traverses. The S contents of lag are similar to those of the top soil.

Titanium and Zirconium. Titanium and Zr are commonly associated in soils due to their occurrence as detrital grains of resistate minerals e.g., rutile and zircon, which tend to accumulate by physical processes at similar locations within the landscape. The distributions of these elements are therefore considered together.

There is a weak trend for Ti concentrations to be lower in residual material, particularly in the 0 - 1 m subsoils, than in the floodplain soils, probably due to dilution by carbonate minerals (Figure 15). It appears to be hosted dominantly by anatase and rutile although some may be present adsorbed to kaolinite and hematite (Fordham and Norrish, 1979). Aluminium, K, Mn, P, Ce, Ga, La, Nb, Nd, Pb, Rb, Y, Zn and Zr are significantly correlated with Ti. Zirconium distributions are broadly similar to those of Ti (Figure 15). However, Ti concentrations tend to increase deeper in the profile, whereas Zr tends to be evenly distributed. The reasons for this are not clear but suggests that Ti maybe more mobile in soil environments than Zr. The Ti-Zr plot suggests that the samples are of andesitic rather than basaltic origin (cf., Mt. Hope, Lintern *et al*, 1991).

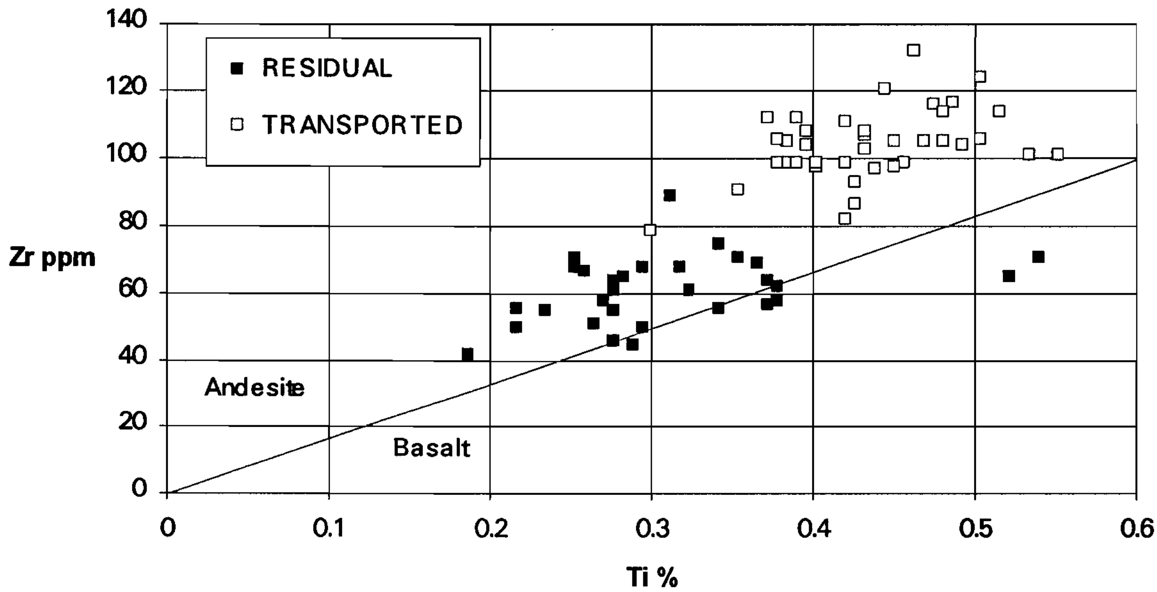


Figure 15: Comparison of Ti and Zr in the 0 - 1 m sample in soils developed on residual and transported substrates. The andesite and basalt fields are derived from Hallberg (1984).

Titanium and Zr are slightly more concentrated in the topsoil than the 0 - 1 m samples, but show a similar distribution. This is consistent with the behaviour of resistate minerals which tend to be residually concentrated towards the top of a soil profile.

Lags are enriched in Ti relative to the oxides underlying soils, confirming the association with Fe topsoils or subsoils. However, Zr concentrations in lag are lower than those found in the topsoil.

Scandium, Yttrium, Lanthanum, Cerium, Neodymium. The rare earth elements Y, La, Ce and Nd have similar distributions for the three types of sample media. In the subsoils, there is a general trend for them to be highest in the floodplain than residual material and a slight trend to be more concentrated at 0 - 1 m than deeper in the profile. This trend continues into the topsoil with similar concentrations to those found at 0 - 1 m. Lag concentrations are generally similar to those found in soils, although a La maximum was found in a sample from the floodplain. The REE show only a weak correlation, particularly in the floodplain where there may be an association between REE and Mn (Figure 16; cf. Profile G), suggesting that Mn oxide may be acting as an adsorption site for these elements.

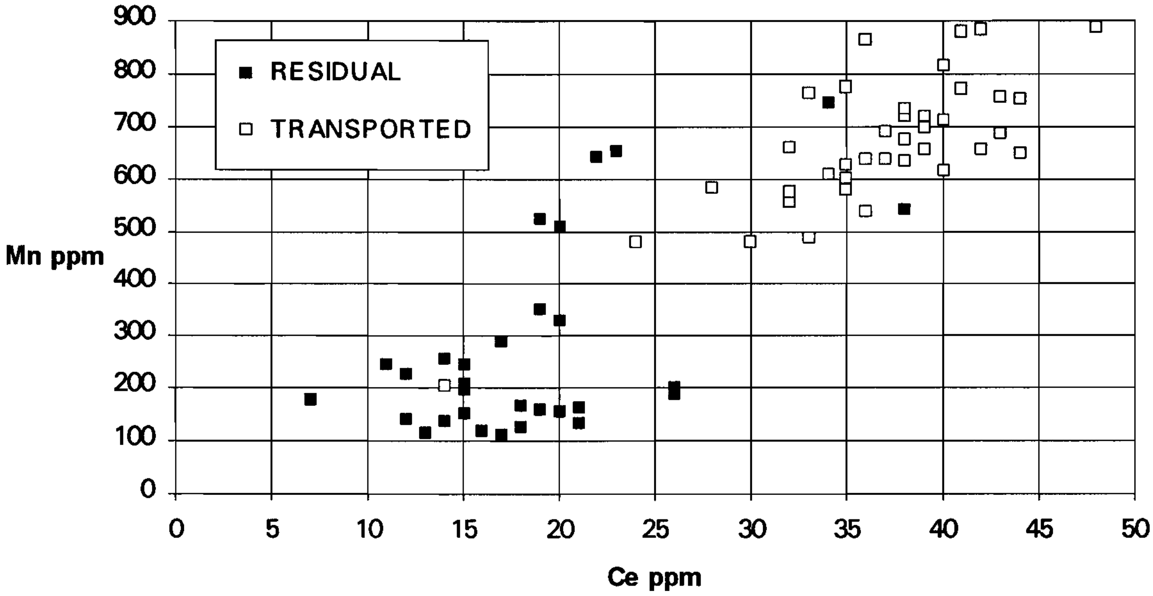


Figure 16: Comparison of Ce and Mn in the 0 - 1 m sample in soils developed on residual and transported substrates.

Scandium contents are highest in the residual subsoils but show little variation with depth. Concentrations in topsoils are similar to slightly lower than the subsoils. The highest concentrations of Sc (60 to 70 ppm) were found in the lag. A weak correlation between Fe and Sc in the floodplain 0 - 1 m soils (Figure 17) suggests that Sc may be preferentially concentrated in Fe oxides. Scandium is reported to concentrate in clay- and silt-sized particles rich in Al and Fe (Dudka, 1992) and ScO(OH) forms structural analogues with goethite and lepidocrocite. Scandium was noted to concentrate in lateritic Fe oxides at Mt. Percy (Butt, 1992).

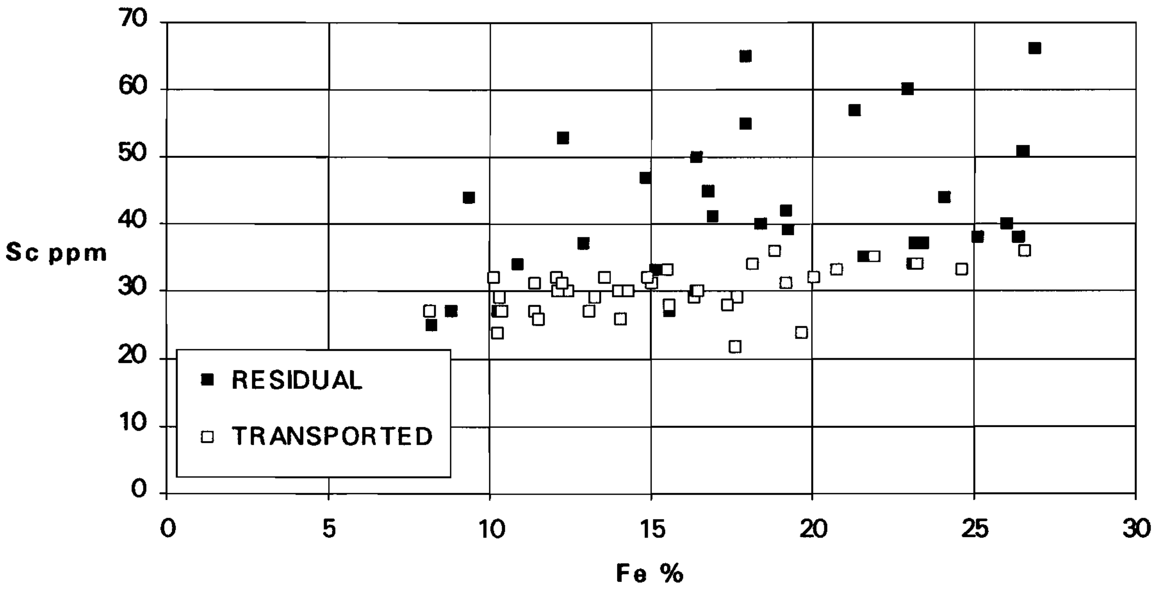


Figure 17: Comparison of Fe and Sc in the 0 - 1 m sample in soils developed on residual and transported substrates.

Cobalt and Nickel. Cobalt and Ni distributions are similar and will be considered together (Figure 18). Their distributions are probably determined by adsorption on to oxides and oxyhydroxides of Fe and Mn, although they are less strongly correlated with Fe than As, V and Cr. Concentrations of both elements are higher in residual soils than in the floodplain and, except on Traverse 2 (4490N), show little variation with depth. On Traverse 2, concentrations increase two- to three-fold lower in the profile, with maxima of over 300 ppm Ni, 80 ppm Co. The increases are probably due to the higher abundance of Fe in this traverse rather than a local source of Ni and Co.

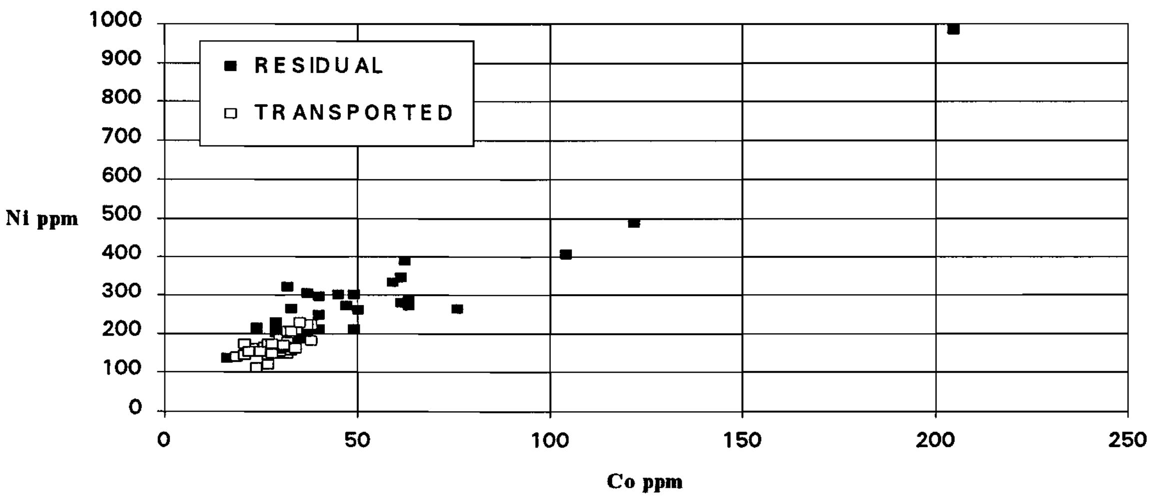


Figure 18: Comparison of Co and Ni in the 0 - 1 m sample in soils developed on residual and transported substrates.

Copper, Lead and Zinc. Copper abundances are broadly similar on each traverse and show little discrimination between residual and floodplain soils, although concentration tend to be higher and more variable on the former. The greatest discrimination is apparent on the two northern traverses, 4705N and 4875N. The Cu contents of the topsoils tend to be lower than those of corresponding soils at 0 - 1 m but, in contrast, concentrations in lag are generally higher.

Abundances of Zn (< 100ppm) and, in particular, Pb (< 20ppm) are low and variable on each transverse. Concentrations of both elements tend to be greater at 0 - 1 m than deeper in the profile and to be greater still in the topsoil. The higher Pb contents are found in the lag (15 - 23 ppm). There is no significant discrimination between residual and floodplain soils and Zn variability is probably related to organic matter content. The highest Zn contents occur in the woodland zone on 4200N.

4.2 Soil Profiles

Pits were excavated at several sites to examine the soil profiles and to determine more precisely the horizons and minerals hosting Au and other elements. The locations of the pits are shown in Figure 4. Profiles A, B, C, H and I are from the floodplain and profiles E, F and K from the residual zone (subdued spur). Profiles G, H, I, J and K are all located on traverse 4200N, in a section across the mineralization from the background on the floodplain (G), the palaeochannel (H, I) and the floodplain east of the palaeochannel (J) to the residual anomaly (K). The texture, colour (Munsell notation) and structure of the profiles has been logged and is largely determined by its position within the landscape (see section on Site Description). The presence of carbonate was determined in the field using 1M HCl and checked in the laboratory by chemical analysis and X-ray diffraction. Samples of the principal horizons were analysed for Au and a range of minor and trace elements and distributions plotted as depth functions. Element associations were estimated from correlation matrices, binary plots and comparisons of the distributions. A summary of the profile data is provided below; detailed descriptions are given in the Appendix.

4.2.1 Gold

The distribution of Au in the soil profiles appears to be primarily concentrated in the top metre, consistent with the drill data (Figure 5). Pedogenic carbonate also tends to be concentrated in the top metre and, therefore, appears to be associated with Au in certain profiles (A, B, E, F and K). The higher correlations and greater Au contents (100 to 300 ppb) occur in the residual soil profiles, and assume approximate Gaussian normal depth-concentration distributions, skewed towards the land surface, in a manner similar to that observed at Mt. Hope and Panglo. However, the very strong correlations between Au and the alkaline earth metals, recorded at Mt. Hope and Panglo, are not apparent at Zuleika. In the floodplain profiles, where pedogenic carbonate content is lower, some of the Au appears to be either associated with other soil components, or be randomly distributed. In profile C, a hardpan, poor in carbonate, has developed close to the surface within which Au appears to be partially concentrated, and associated with the evaporite elements Na and Cl. In profile H, a highly anomalous value of 910 ppb Au is probably due to particulate Au; an alternative explanation is there has been an analytical error but this is unlikely as similar but less striking anomalies occur in profiles A and I.

4.2.2 Major and Trace Elements

The profiles developed within residual areas are richer in the alkaline earth metals (Ca, Mg and Sr) which occur principally in calcite and, less commonly, dolomite, and have regular element distributions compared with the floodplain soils. In residual areas, Fe increases with depth and occurs principally in hematite in the first metre and goethite in the second metre; Fe is most abundant in the floodplain where it is associated with lenses of hematite-rich gravels. Aluminium occurs primarily as kaolinite and is slightly more abundant in the residual soils. Silicon occurs in quartz sands in surficial horizons in all profiles, and, in addition as gravels and rubble that form a large part of the floodplain soils; Si is also found in clay minerals, principally kaolinite. Sodium, Cl, Br and total dissolved solids (TDS) are strongly related suggesting that halite is present in variable quantities both in the residual and floodplain soils; the highest TDS values on 4200N occur above the palaeochannel mineralization which is consistent with the data for the drilling. Potassium and Rb are often associated with the saline horizons, although some may occur in relict muscovite.

The distribution and concentrations of the trace elements are highly variable so general characteristics are difficult to establish. However, the associations between trace and major elements is easier to establish where there is a strong separation of the major mineral or size fraction components within each profile e.g. trace elements commonly associated with Fe oxides (As, Cu, Cr, Ga, Mn, P, Sc, Ti and V) or hosted by resistant detrital minerals (REE, Cr, Pb, Ti, Zr) have common maxima in the gravel horizons in the floodplain profiles.

4.3 Vegetation

Samples of vegetation (leaves, small branches of eucalypts, and bluebush) and mull (decaying organic material on the ground principally derived from eucalypts) were collected from traverses 4705N and 4490N. The samples were washed and dried after collection. Washing is essential to reduce the amount of soil material that adheres to the mull, although some contamination cannot be prevented. However, the results indicate that elements which are notably more concentrated in the residual topsoils compared with the floodplain (Ca, Mg, Cr and As/Fe ratio) are not repeated for vegetation which suggests that most data for the vegetation are real and are not as a result of soil contamination. Samples were ground in an agate mill (to minimize contamination from metal mill components) and analyzed directly by INAA and XRF without ashing. Data are reported as dry weight but an approximate ash weight can be calculated by multiplying by 20, 12 and 5 for eucalypt leaves, eucalypt mull and bluebush, respectively.

4.3.1 Gold

The normal INAA detection limit for Au (0.5 ppb) in dry vegetation was too high for meaningful data to be collected for the vegetation samples and so an experimental concentration procedure was developed; briefly, samples were digested in a peroxide/nitric acid mix, diluted, bottled-rolled with activated carbon, washed, and the carbon was sent for INAA. In addition, this procedure enabled Au analysis of the bluebush samples which are salt-rich so that Na causes interference during INAA; the salt is effectively washed out during the bottle roll. The data suggest that Au contents were generally highest in vegetation from the residual soils. The highest Au content recorded for mull, eucalypt and bluebush was 19.2, 1.2 and 7.9 ppb, respectively. Maximum Au concentrations were lower than those found at Mt. Hope (eucalypt 5.9 ppb, mull 71.2 ppb) and similar to those at Panglo (eucalypt about 2 ppb, saltbush about 3 ppb). Gold contents of mull are considerably greater than those found in the eucalypt suggesting there has been some retention of the element (see below), but are lower than values found in the soil. However, Au content of *ashed* mull is higher than in corresponding topsoils. The Au content of mull is greatest in the residual soils (maximum 19.2 ppb) suggesting there to be an association with soil Au. However, if this unusually high maximum is excluded, Au_{mull}/Au_{soil} ratios are greater in the floodplain when compared with residual areas. This suggests that Au is more available to plants in the floodplain because either (i) it is chemically more labile or (ii) concentrations are greater in the root zone. Other, smaller maxima occur in the floodplain soils but they are not necessarily above, and therefore associated with, the palaeochannel mineralization to be significant for exploration purposes. The bluebush maximum value appears to be located directly over the palaeochannel mineralization. However, Al, Ca, Cl, Cr, Fe, P, S and Si concentrations also appear to be highest in this sample which strongly suggests that there may have been some contamination from soil in this particular case.

4.3.2 Major and Trace Elements

Generally, there are no highly significant differences between major element concentrations of vegetation and mull in residual and floodplain zones, although there are a few exceptions. Calcium and Mg contents of mull and eucalypt are generally greater over the residual zone than the floodplain on both traverses, reflecting the soil carbonate content, although no difference was found in bluebush. Chloride concentrations are notably higher in some residual zone mull and eucalypt on 4490N but this trend is not observed on 4705N.

Differences between trace elements are more equivocal than for the major elements. However, Zn concentrations tend to be greatest in the floodplain. Trace element availability in plants is related to the pH of the soil - the greater the pH, the less available is the element. The alkaline residual soils should make important trace elements (e.g., Zn and Mn) less available, and this appears to be the case for Zn, at least.

Classification	Element (with Retention Factor)
Elements strongly retained in mull.	Sc (30.1), Fe (22.5), Al (19.8), Ti (17.2), Cr (15.7), La (11.2), V (9.5), Si (9.3), Au (7.7) and Th (5.8).
Elements weakly retained in mull.	Ni (2.6), Mn (2.2), Ca (2.1), Sr (1.9), Mg (1.6) and Cu (1.1).
Elements poorly retained in mull.	S (0.7), Zn (0.7), P (0.4), Br (0.4), K (0.2), Na (0.2) and Cl (0.1)

Table 2: Classification and Retention Factors for selected elements on 4490N.

The ratios of the mean element abundances in mull and associated fresh vegetation have been calculated as retention factors (RFs) on traverse 4705N. The elements have been classified in Table 2 according to whether they have been leached (<1), weakly retained (>1 to <3) or strongly retained (>3) in the mull (Table 2). This suggests that Au is retained in the mull and may be a better sample medium than the fresh material, as it tends to concentrate and therefore can be detected more easily; however, one major disadvantage of using mull as a sample medium is that it requires stringent cleaning procedures. Aluminium and Si are strongly retained in the mull with RFs of 22.5, 19.8 and 9.3, respectively. By contrast, S, P, K, Na and Cl are strongly leached, (RFs of 0.7, 0.4, 0.2, 0.2, and 0.1); these trends are not dissimilar to those found in the soil.

5 DISCUSSION AND CONCLUSIONS

Comparison of Sample Media. Gold concentrations tend to be greatest in the top metre of the regolith profiles, usually (but not always) within carbonate horizons. The concentrations decrease in the following order:

0-1 m > 1-2 m > topsoil > lag > 2-3 m > mull > 3-4 m > bluebush > 4-5 m > eucalypt

When similar sample media are compared, all but lag show the same Au distributions along the traverses, with higher concentrations in residual soils than floodplain soils. In ferruginous lags, however, Au is more randomly distributed, with higher and more erratic values occurring in the floodplain. This is well illustrated by data from the profiles H and I, in which localized high concentrations suggest the presence of particulate Au, either free or occluded within lag. Thus, the data suggest that at least some of the Au in the floodplain may be clastically derived from upslope.

Identification and Interpretation of Soil Anomalies. The principal objective at Zuleika was to determine whether Au is present in anomalous concentrations in surficial horizons above palaeochannel mineralization. In addition, it is here also necessary to determine whether any anomalies found are simply due to downslope dispersion from the soil anomaly in the adjacent or upslope areas of residuum.

With the exception of Au interpreted as being in particulate form in lag, most of the Au in both residual and floodplain soils appears to be associated with the pedogenic carbonate horizon and thus to have been chemically precipitated. However, this does not mean that such Au in the floodplain can only have been derived chemically from an underlying source rather than one that is laterally distant. Gold can be very mobile in the soil environment (Gray *et al.*, 1990) and it is quite possible that clastically derived Au has been dissolved and reprecipitated in the soil following deposition, with or without further lateral dispersion. In addition, pedogenic carbonates containing Au may themselves be eroded and redeposited by sheetwash. Accordingly, Au in the soils of the floodplain, including that forming the anomalies over palaeochannel mineralization could have several origins, including:

(i) clastic dispersion from residual areas upstream to the north or east ;
(ii) hydromorphic dispersion from the mineralization in the palaeochannel.

The probable presence of particulate Au and observations made during heavy rainfall indicate that erosion and clastic dispersion was and still is active, hence origin (i) probably contributed to the anomaly. However, evidence from Mt. Pleasant (Lawrance, 1988; Lawrance and Butt, 1992) and Panglo (Lintern and Scott, 1990) demonstrate that mineralization concealed by transported overburden can be indicated by superjacent Au anomalies in soils, hence origin (ii) may also apply. The processes of enrichment are not fully understood, but may involve chemical transport of dissolved Au deep in the regolith by diffusion and capillarity, evapotranspiration and cycling by deep-rooted plants and accumulation in the evaporite horizon in soils (see discussion in Butt *et al*, 1991); physical transport of minute Au particles, carried to the surface by bedrock gases has also been suggested (Kristiansson *et al*, 1990).

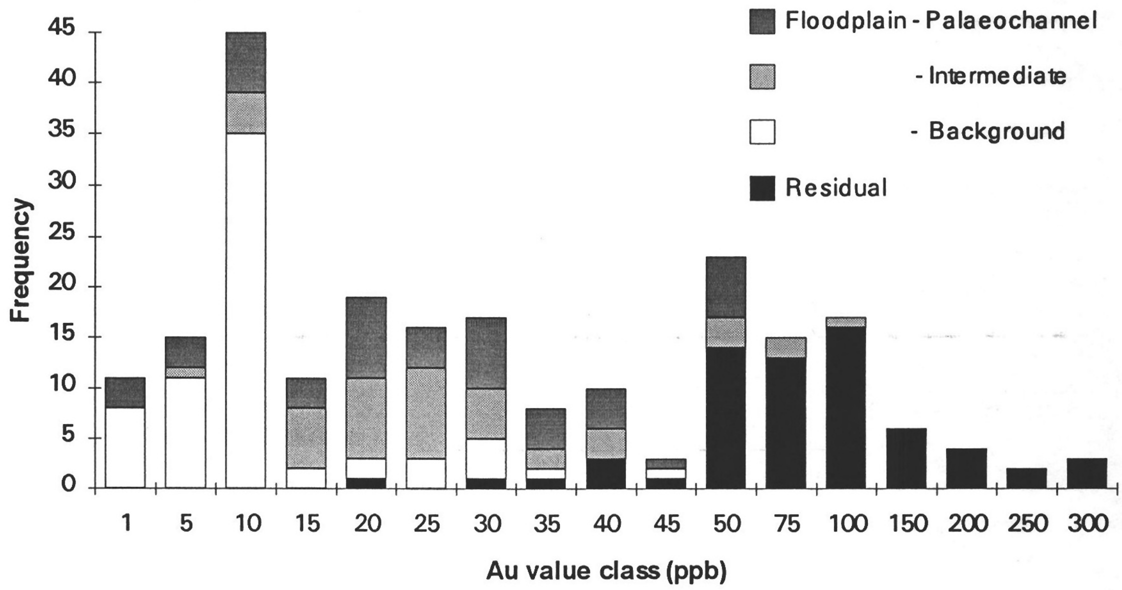
The normal procedure for evaluating exploration data from such an area is to treat the different geomorphological zones separately. Thus here, data from residual and floodplain soils form geochemically distinct sub-sets, with different mean and standard deviations (see Table 1). However, further division of the floodplain sub-set indicates that the pattern of distribution, frequency and cumulative frequency of gold values above the palaeochannel cannot be easily differentiated from the intermediate floodplain sub-set lying between the palaeochannel and the residuum (Figure 19); intermediate and palaeochannel can be distinguished from the background sub-set. In other words, the palaeochannel mineralization in this area could not have been detected in soil material by conventional geochemical interpretative techniques (Figure 19). The major differences between the cumulative frequency curves for palaeochannel and intermediate sub-sets are primarily due to "edge effects" and represent samples at the boundaries of their respective sub-sets.

The major difficulty in determining the origin of the Au in the surficial horizons is due to the proximity of the palaeochannel and residual zones, even on line 4200N where they are 250 m apart. Further auger sampling to the south of 4200N may improve the geochemical separation of the palaeochannel and intermediate sub-sets; however, this is strongly dependant on the presence of high-grade deposits in the palaeochannel or underlying sediments in order to establish an unequivocal link between the deposits and surficial Au anomalies. If the palaeochannel mineralization continues but is weak, then it is probable that surficial anomalies will also be weak and indiscernible from intermediate or background geochemical sub-sets.

An alternative approach, applicable to situations where subtle anomalies are potentially being obscured by dispersion from other sources or by contamination, is to investigate possible differences in element associations. This does not seem to valid here, however, since

1. the palaeochannel mineralization itself has no elements other than Au specifically associated with it and,
2. the mechanism of surface enrichment is not known to apply to elements other than Au.

a)



b)

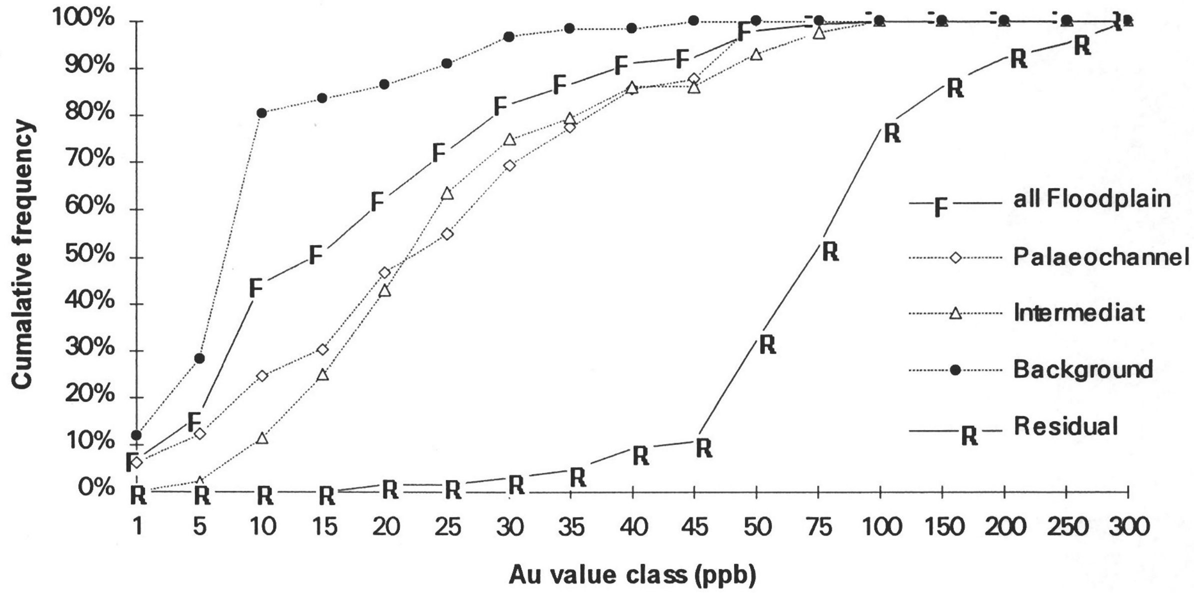


Figure 19: Frequency distribution (a) and cumulative frequency distribution (b) of Au values for floodplain (background, palaeochannel and intermediate) and residual data sub-sets. The Au valu class have data *from* their assigned value *to* (but not including) the adjacent class to the right e.g., class 10 contains all data from 10.00 ppb to 14.99 ppb.

Differences in the concentrations and distributions of the major and trace elements suggest that the soils of the floodplain are not strongly influenced by contributions from adjacent residual soils to the east. The top metre of the floodplain soils is more homogeneous (e.g., as observed in Fe/Cr, Fe/Sc, Si/Al ratios) and has different mean concentrations than equivalents in residual soils, suggesting contributions from updrainage rather than adjacent areas to the east; however, Ca:Au ratios are similar, which does not preclude the adjacent areas as a source for the Au in the floodplain.

Selective extraction analyses have shown that it is possible to distinguish mobile Au associated with carbonate from less soluble Au interpreted as being associated with Fe oxides (Gray et al., 1990). Early results indicate that a third form of Au may occur. The Au associated with the carbonate in the residual soils at Zuleika is less mobile than the Au in the floodplain (Gray *et al*, in prep.). Further work is required to examine whether Au in the floodplain sub-sets can be distinguished from one another (particularly intermediate and palaeochannel) in terms of their mobility i.e. a fourth form of Au. However, the situation may be difficult to resolve by these techniques, since, as discussed above, most Au appears now to be associated with the carbonate horizons yet could have been physically transported, either as grains of free Au or with eroded carbonate, and since been chemically reworked. Such Au would be presumably difficult to distinguish from Au that has been derived from the palaeochannel as it has undergone similar chemical reworking.

Location of palaeochannnels. The anomalous Na and Cl values in the soils above the palaeochannel compared to adjacent areas of the floodplain and in soils on residuum may provide a method for locating palaeochannels elsewhere by testing for high salinity in surface samples such as 0 - 1 m composites. This phenomenon is related to that giving an electromagnetic response (see Section 1) and may have the advantage of locating the boundaries of the thalweg more precisely. However, these data need substantiating, because the high salinity could reflect the present surface hydrology rather than that of the buried channel. The process by which salt could move vertically through the regolith profile is unknown but may well be similar to that postulated for Au. The observation that Au enrichment in soils may coincide with that of salt rather than carbonate in some profiles may be a further indication that Au is precipitating as an evaporite.

Conclusion. The results of this investigation remain inconclusive. In retrospect, it is evident that the site was not ideal for determining whether buried mineralization can give a surface anomaly. Nevertheless, contamination, whether natural or due to previous mining or other "cultural" activity, represents a genuine exploration problem, although in this case there appears to be no ready solution other than by the original approach of systematic drilling of carefully selected target environments. However, since this project commenced, further exploration near Panglo by Pancontinental Mining Ltd., (Baseline Deposit, now mined) and west of New Celebration by Newcrest Mining Ltd., (Steinway Deposit) has indicated that mineralization of similar style and geomorphological setting to that at Zuleika is certainly indicated by superjacent anomalies. These are just two examples that demonstrate that mineralization concealed beneath up to 20 m of barren overburden may have a significant surface expression, in each case the anomalies being associated with the pedogenic carbonates. Their exploration history demonstrates also that shallow soil augering, which includes the carbonate horizon in the sample, is an effective exploration procedure.

6 ACKNOWLEDGMENTS

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8 APPENDICES

8.1 Drill Samples (pp 38 - 55)

Tables and charts are presented for the drill, topsoil and lag data for 4875N, 4705N, 4490N and 4200N. The following codes are used in the charts:

●	0 - 1 m
○	1 - 2 m
Δ	2 - 3 m
□	3 - 4 m
☆	4 - 5 m
————	TOPSOIL
- - - - - - - -	LAG

8.2 Soil Profiles (pp 56 - 83)

Logs of the soil profile pits and details of the geochemical characteristics of each pit are given below, recording principally the texture, colour (Munsell notation) and structure of the horizons. The presence of carbonate was determined in the field using 1M HCl and checked in the laboratory by chemical analysis and X-ray diffraction. Samples of the principal horizons were analysed for Au and a range of minor and trace elements and distributions plotted as depth functions. Element associations were estimated from correlation matrices, binary plots and observations of the distributions and are noted after the descriptions. NB: in the element associations, "?" indicates that the association is not clear, and (part) or (p) indicates that the association is evident in only part of the profile.

8.3 Vegetation (pp 84 - 90)

Charts and tables are presented for the vegetation data for 4705N (mull, eucalypt and bluebush) and 4490N (mull and eucalypt). In addition, topsoil data has been included in the charts for comparison purposes.

Drill, lag and topsoil chemical data

No.	E	N	DEPTH	Al xrf %	Ca xrf %	Cl xrf ppm	Fe xrf %	K xrf %	Mg xrf %	Mn xrf(tr) ppm	Na xrf %	P xrf %	S xrf ppm	Si xrf %	Ti xrf(tr) %	Ag xrf(tr) ppm	As xrf(tr) ppm	Au inaa ppb	Ba xrf(tr) ppm	Bi xrf(tr) ppm
1A	2750	4490	0.5	5.29	3.73	1830	8.19	0.40	2.70	644	0.73	0.009	8890	23.44	0.31	<1	17	72	131	<1
5A	2710	4490	0.5	3.85	8.60	790	8.81	0.30	2.53	525	0.39	0.013	520	20.57	0.25	<1	6	116	169	<1
9A	2670	4490	0.5	3.60	9.11	700	10.23	0.33	2.63	654	0.34	0.013	530	19.76	0.26	<1	4	76	162	<1
17A	2590	4490	0.5	4.75	8.98	410	16.76	0.15	3.88	255	0.13	0.010	290	12.41	0.27	<1	24	382	70	<1
19A	2570	4490	0.5	4.36	6.70	610	19.19	0.18	2.51	289	0.17	0.011	270	14.95	0.29	1	21	164	82	<1
21A	2550	4490	0.5	3.78	11.86	590	12.91	0.15	4.42	226	0.11	0.010	190	11.45	0.22	<1	16	164	55	<1
23A	2530	4490	0.5	4.81	9.62	210	22.93	0.06	3.73	110	0.10	0.008	180	7.67	0.28	4	51	286	50	<1
30A	2460	4490	0.5	5.59	2.20	360	12.41	0.43	0.88	722	0.33	0.017	270	26.08	0.40	<1	18	28	204	<1
32A	2440	4490	0.5	6.01	2.38	400	12.13	0.54	1.21	777	0.34	0.018	250	25.21	0.40	1	13	26	186	1
35A	2410	4490	0.5	6.92	1.39	810	18.17	0.46	0.97	880	0.37	0.022	890	21.48	0.52	<1	22	42	223	1
39A	2370	4490	0.5	4.78	4.69	990	20.78	0.25	1.40	619	0.24	0.014	340	18.40	0.44	<1	26	32	155	<1
41A	2350	4490	0.5	6.03	2.84	1950	13.98	0.46	0.96	713	0.48	0.016	550	23.95	0.42	1	22	26	213	1
51A	2250	4490	0.5	5.01	1.99	20	26.54	0.22	0.66	693	0.13	0.016	190	18.85	0.55	1	28	6	195	<1
53A	2230	4490	0.5	5.80	1.90	870	21.88	0.33	0.74	640	0.36	0.016	500	20.28	0.50	2	28	10	180	<1
55A	2210	4490	0.5	5.15	1.54	490	24.63	0.25	0.54	650	0.25	0.018	370	20.44	0.53	1	26	6	157	<1
57A	1900	4200	0.5	3.67	1.12	100	17.61	0.20	0.36	481	0.16	0.016	140	28.31	0.42	2	19	1	105	1
59A	1920	4200	0.5	3.70	0.57	60	19.67	0.14	0.32	479	0.14	0.015	130	27.54	0.43	<1	26	4	128	<1
62A	1950	4200	0.5	5.14	1.01	100	17.66	0.30	0.61	662	0.20	0.017	170	25.44	0.47	<1	22	14	167	<1
76A	2090	4200	0.5	5.83	1.93	1030	10.27	0.51	0.96	585	0.46	0.019	370	27.54	0.38	1	11	12	154	1
78A	2110	4200	0.5	7.28	1.87	3180	8.12	0.70	1.31	772	0.70	0.021	2090	25.60	0.46	<1	9	12	177	1
80A	2130	4200	0.5	7.31	0.99	950	13.30	0.58	1.02	686	0.48	0.019	560	24.46	0.50	<1	18	26	173	2
82A	2150	4200	0.5	6.12	1.84	700	11.40	0.48	0.95	677	0.43	0.019	350	26.38	0.42	1	11	36	146	<1
83A	2160	4200	0.5	5.51	2.25	930	15.55	0.40	0.90	603	0.35	0.018	460	24.34	0.43	<1	20	22	150	1
86A	2190	4200	0.5	5.73	2.19	770	11.54	0.46	0.97	634	0.36	0.018	240	26.32	0.40	<1	13	14	180	1
100A	2330	4200	0.5	5.58	1.67	<20	14.06	0.41	0.78	627	0.16	0.016	140	26.35	0.43	3	16	18	183	<1
102A	2350	4200	0.5	5.83	0.77	10	17.41	0.41	0.57	720	0.13	0.018	150	25.12	0.46	3	23	24	180	<1
104A	2370	4200	0.5	5.94	0.34	0	20.02	0.37	0.49	817	0.13	0.023	190	23.57	0.49	2	27	32	183	<1
106A	2390	4200	0.5	6.07	0.56	10	15.53	0.44	0.63	883	0.13	0.020	170	25.85	0.47	1	22	26	173	<1
113A	2460	4200	0.5	6.62	6.88	140	26.02	0.07	1.77	136	0.10	0.009	260	9.38	0.54	<1	58	86	76	<1
114A	2470	4200	0.5	9.04	2.68	180	26.52	0.02	1.56	119	0.13	0.007	140	10.73	0.52	<1	61	86	27	2
116A	2490	4200	0.5	3.38	18.25	100	9.37	0.10	2.57	245	0.09	0.007	360	8.73	0.19	3	13	44	83	1
117A	2500	4200	0.5	7.56	3.50	180	26.86	0.07	0.33	126	0.10	0.010	340	12.89	0.37	3	34	30	72	3
120A	2200	4705	0.5	5.78	2.40	820	19.21	0.36	0.77	754	0.30	0.017	260	22.14	0.45	4	25	10	197	<1
122A	2220	4705	0.5	6.03	3.18	950	10.39	0.49	0.95	764	0.40	0.017	400	25.50	0.38	<1	9	14	221	<1
124A	2240	4705	0.5	5.47	2.26	740	16.37	0.38	0.77	658	0.30	0.017	310	24.34	0.43	<1	26	8	158	<1
125A	2250	4705	0.5	6.26	1.66	1440	16.42	0.53	0.83	769	0.43	0.018	950	23.66	0.45	1	23	10	186	1
142A	2420	4705	0.5	7.21	0.11	1820	13.60	0.42	0.58	202	0.53	0.011	650	25.84	0.49	<1	22	6	200	<1
144A	2440	4705	0.5	6.65	0.59	2970	15.00	0.55	1.01	887	0.64	0.022	600	24.22	0.44	<1	17	24	167	1
146A	2460	4705	0.5	5.84	2.44	1560	14.33	0.48	1.42	699	0.38	0.017	900	23.60	0.39	<1	11	42	178	<1
148A	2480	4705	0.5	4.56	8.33	2070	11.38	0.32	1.59	489	0.41	0.013	470	19.61	0.30	<1	17	62	223	<1
150A	2500	4705	0.5	5.28	5.86	910	18.84	0.26	1.19	539	0.27	0.014	360	17.73	0.35	<1	28	58	184	1
159A	2590	4705	0.5	6.50	8.34	370	17.93	0.11	2.88	161	0.16	0.008	250	10.89	0.25	<1	34	76	143	1
161A	2610	4705	0.5	4.70	9.79	660	16.41	0.10	5.09	116	0.19	0.004	380	8.93	0.23	<1	29	138	213	<1
162A	2620	4705	0.5	4.45	9.05	250	21.31	0.09	5.00	141	0.13	0.007	250	7.76	0.22	<1	42	122	184	1
163A	2630	4705	0.5	4.29	9.94	870	12.27	0.16	5.94	179	0.24	0.005	330	10.93	0.26	<1	20	1672	159	1
164A	2640	4705	0.5	6.35	5.08	810	17.90	0.17	2.84	190	0.23	0.008	400	14.58	0.37	<1	29	234	198	<1
166A	2660	4705	0.5	6.29	7.18	80	18.44	0.13	3.00	196	0.07	0.009	180	11.28	0.29	1	23	132	57	1
168A	2680	4705	0.5	6.66	4.16	690	15.15	0.28	1.89	352	0.30	0.013	390	18.85	0.32	<1	21	68	139	1
170A	2700	4705	0.5	5.41	6.00	780	14.87	0.14	2.25	245	0.18	0.011	430	17.66	0.29	2	4	128	163	<1
180A	2200	4875	0.5	6.76	1.81	1480	13.09	0.57	0.93	865	0.42	0.019	2800	24.45	0.43	<1	17	10	237	<1
183A	2230	4875	0.5	6.74	2.37	350	16.46	0.51	0.93	735	0.36	0.019	4230	21.28	0.48	<1	21	18	236	<1
186A	2260	4875	0.5	6.23	1.96	700	23.25	0.39	0.78	567	0.30	0.021	1190	18.67	0.48	<1	31	12	239	3
204A	2440	4875	0.5	5.47	6.23	2090	12.06	0.50	1.19	610	0.38	0.013	360	20.91	0.38	<1	15	28	171	1
206A	2460	4875	0.5	5.43	7.48	1480	10.17	0.52	1.57	582	0.36	0.012	370	20.06	0.37	3	14	42	249	<1
208A	2480	4875	0.5	5.70	5.79	2790	10.31	0.60	1.56	578	0.48	0.016	620	21.59	0.38	<1	15	42	202	2
210A	2500	4875	0.5	5.88	4.55	2120	12.25	0.61	1.32	638	0.47	0.016	560	22.08	0.40	<1	16	36	184	<1
212A	2520	4875	0.5	5.12	5.75	1610	14.93	0.44	1.29	659	0.33	0.016	440	20.11	0.39	3	19	50	196	<1
220A	2600	4875	0.5	5.67	5.00	110	26.39	0.12	0.70	200	0.08	0.013	270	12.70	0.34	2	51	78	232	2
221A	2610	4875	0.5	5.22	8.51	150	21.61	0.11	0.88	164	0.08	0.013	270	12.31	0.28	<1	37	84	160	<1
222A	2620	4875	0.5	5.77	6.62	240	23.20	0.10	0.92	132	0.13	0.009	280	11.96	0.28	3	32	80	202	2
223A	2630	4875	0.5	5.29	8.48	550	23.43	0.12	1.05	168	0.18	0.008	330	11.01	0.35	<1	31	90	253	<1
224A	2640	4875	0.5	6.00	7.98	170	24.09	0.10	1.37	157	0.10	0.009	270	9.46	0.32	3	33	64	212	<1
225A	2650	4875	0.5	4.99	7.18	230	25.11	0.07	3.47	151	0.12	0.007	290	7.60	0.34	<1	30	42	323	<1
226A	2660	4875	0.5	4.48	8.58	170	23.15	0.11	3.83	206	0.07	0.007	270	7.71	0.38	<1	22	36	441	<1
237A	2770	4875	0.5	4.35	10.58	1050	15.58	0.16	3.92	328	0.19	0.011	570	11.19	0.28	3	11	92	212	<1
238A	2780	4875	0.5	4.77	7.82	2270	19.26	0.19	1.47	542	0.34	0.011	780	14.65	0.38	1	18	114	135	2
239A	2790	4875	0.5	4.91	6.12	3730	16.88	0.24	2.15	746	0.44	0.012	730	16.90	0.37	1	17	86	103	<1
240A	2800	4875	0.5	3.52	12.19	1930	10.86	0.22	2.69	511	0.33	0.010	750	15.19	0.28	2	15	74	283	<1
1B	2750	4490	1.5	6.20	0.92	2140	8.47	0.37	2.81	491	0.98	0.007	780	25.42	0.31	<1	10	80	119	<1
5B	2710	4490	1.5	5.52	0.73	1310	12.95	0.12	2.24	339	0.61	0.010	520	25.21	0.30	3	17	60	66	<1
9B	2670	4490	1.5	5.14	1.89	1920	11.78	0.21	2.29	384	0.80	0.008	790	23.71	0.34	<1	14	60	178	1
17B	2590	4490	1.5	7.13	2.92	1180	23.23	0.09	2.09	299	0.30	0.005	450	13.14	0.41	<1	18	158	201	1
19B	2570	4490	1.5	6.59	3.21	1100	21.63	0.12	2.22	212	0.35	0.006	380	14.08	0.45	2	19	106	84	<1
21B	2550	4490	1.5	8.27	3.92	420	21.42	0.07	2.44	210	0.24	0.005	350	11.54	0.37	<1	19	58	154	2
23B	2530	4490	1.5	7.73	2.53	360	33.56	0.04	1.70	101	0.24	0.006	300	8.08	0.38	1	64	84	112	<1
32B	2440	4490	1.5	5.84	2.02	540	25.74	0.15	0.80	367	0.29	0.012	320	17.24	0.40	<1	53	20	116	4
35B	2410	4490	1.5	5.16	2.31	600	26.46	0.17	1.07	577	0.30	0.013	520	17.56	0.52	3	30	30	314	4
39B	2370	4490	1.5	5.03	4.27	1530	11.10	0.22	2.75	360	0.39	0.008	460	22.35	0.35	3	19	20	155	<1
41B	2350	4490	1.5	5.19	1.50	2140	25.41	0.21	0.66	777	0.36	0.014	400	20.05	0.49	<1	32	20	157	<1
51B	2250	4490	1.5	6.01	1.19	230	22.46	0.23	0.99	461	0.23	0.011	270	20.01	0.51	2	37	2	336	2
53B	2230	4490	1.5	4.82	1.71	900	29.14	0.13	0.66	539	0.33	0.012	470	17.79	0.54	2	29	4	120	<1
55B	2210	4490	1.5	6.82	0.48	710	24.01	0.25	0.51	297	0.34	0.014	900	19.50	0.56	<1	34	1	271	<1
57B	1900	4200	1.5	5.43	1.44	320	35.97	0.16	0.43	365	0.19	0.016	240	13.45	0.68	4	40	1	109	<1
59B	1920	4200	1.5	4.33	1.35	140	30.90	0.09	0.44	460	0.16	0.016	180	18.44	0.59	<1	38	4	124	1
62B	1950	4200	1.5	5.23	1.74	550	30.69	0.13	0.62	467	0.22	0.014	490	15.00	0.57	6	38	8	232	<1

Drill, lag and topsoil chemical data (continued)

No.	E	N	DEPTH	Al xrf %	Ca xrf %	Cl xrf ppm	Fe xrf %	K xrf %	Mg xrf %	Mn xrf(tr) ppm	Na xrf %	P xrf %	S xrf ppm	Si xrf %	Ti xrf(tr) %	Ag xrf(tr) ppm	As xrf(tr) ppm	Au inaa ppb	Ba xrf(tr) ppm	Bi xrf(tr) ppm
76B	2090	4200	1.5	5.77	0.71	1310	14.79	0.34	0.59	333	0.45	0.012	470	26.69	0.44	<1	21	4	181	<1
78B	2110	4200	1.5	5.97	1.01	1830	21.31	0.32	0.80	613	0.47	0.015	720	21.75	0.53	<1	24	12	172	1
80B	2130	4200	1.5	6.85	0.09	570	21.03	0.29	0.44	176	0.36	0.015	780	21.78	0.48	<1	37	2	288	<1
82B	2150	4200	1.5	5.32	1.29	550	24.07	0.23	0.68	535	0.31	0.014	350	20.59	0.53	1	28	28	192	<1
86B	2190	4200	1.5	4.36	1.11	580	23.78	0.13	0.84	550	0.24	0.014	160	22.40	0.44	2	39	12	107	<1
100B	2330	4200	1.5	7.00	0.40	10	24.56	0.12	0.51	399	0.20	0.010	120	19.49	0.47	4	51	8	133	<1
102B	2350	4200	1.5	5.97	3.56	70	26.19	0.10	1.12	459	0.15	0.011	130	15.22	0.49	<1	40	28	142	<1
104B	2370	4200	1.5	5.48	2.97	10	30.91	0.11	0.81	531	0.10	0.013	150	13.98	0.51	1	53	30	141	1
106B	2390	4200	1.5	5.12	4.27	120	28.26	0.08	1.97	371	0.19	0.009	180	12.36	0.48	<1	55	14	128	<1
114B	2470	4200	1.5	7.42	6.90	40	25.05	0.05	0.74	91	0.08	0.008	210	10.43	0.50	<1	51	112	66	<1
116B	2490	4200	1.5	7.42	4.64	340	18.42	0.07	0.77	250	0.16	0.007	390	17.01	0.31	<1	25	18	51	<1
120B	2200	4705	1.5	7.13	1.52	500	21.81	0.28	0.96	202	0.35	0.014	450	18.27	0.49	<1	27	4	399	<1
124B	2240	4705	1.5	6.58	0.39	840	27.86	0.20	0.44	284	0.30	0.014	410	18.00	0.52	<1	45	4	210	<1
142B	2420	4705	1.5	5.98	3.51	2370	12.51	0.53	1.45	703	0.53	0.016	840	22.98	0.38	1	16	42	220	<1
146B	2460	4705	1.5	5.84	2.66	2350	13.02	0.47	1.54	641	0.53	0.012	520	23.57	0.40	3	18	42	196	<1
150B	2500	4705	1.5	5.95	1.08	920	34.75	0.09	0.48	272	0.19	0.010	390	12.76	0.46	<1	58	20	111	2
162B	2620	4705	1.5	7.24	0.71	890	16.72	0.07	1.01	80	0.45	0.003	310	21.99	0.34	2	17	64	116	<1
164B	2640	4705	1.5	8.81	0.85	100	19.07	0.12	0.95	151	0.37	0.006	380	18.41	0.55	<1	31	72	58	1
166B	2660	4705	1.5	8.40	1.32	350	25.79	0.08	0.98	259	0.24	0.007	410	13.39	0.54	1	24	44	119	<1
168B	2680	4705	1.5	9.99	0.11	1260	13.09	0.10	0.28	131	0.29	0.006	440	23.68	0.35	<1	8	18	56	<1
170B	2700	4705	1.5	7.80	0.25	1440	15.60	0.08	0.59	154	0.33	0.008	420	23.69	0.40	3	6	12	72	<1
180B	2200	4875	1.5	7.49	0.06	1200	22.49	0.30	0.43	165	0.37	0.015	910	19.35	0.56	<1	32	1	224	<1
186B	2260	4875	1.5	8.48	0.04	1190	18.24	0.36	0.46	148	0.33	0.015	1040	21.13	0.52	<1	19	1	288	<1
204B	2440	4875	1.5	5.47	6.23	2480	12.06	0.50	1.20	321	0.36	0.014	370	20.89	0.46	<1	27	32	367	2
208B	2480	4875	1.5	6.75	2.51	2160	10.40	0.64	1.65	485	0.59	0.009	620	23.72	0.44	<1	10	46	193	2
212B	2520	4875	1.5	5.84	3.94	1500	11.52	0.52	1.40	566	0.50	0.010	460	23.09	0.43	<1	12	34	190	1
220B	2600	4875	1.5	6.14	2.71	90	29.77	0.06	0.74	97	0.15	0.011	330	12.12	0.40	<1	36	18	291	3
224B	2640	4875	1.5	6.89	1.80	720	29.42	0.07	1.09	121	0.24	0.007	370	9.66	0.50	2	27	46	264	1
238B	2780	4875	1.5	8.12	0.19	2360	24.83	0.06	0.31	271	0.36	0.014	900	16.89	0.62	1	12	6	46	<1
240B	2800	4875	1.5	4.58	0.96	3350	15.13	0.12	3.96	288	0.73	0.008	730	21.63	0.45	1	11	54	90	<1
1C	2750	4490	2.5	6.29	0.11	2100	8.20	0.21	2.78	272	1.06	0.005	610	26.52	0.28	<1	14	22	69	<1
5C	2710	4490	2.5	5.87	0.06	1070	11.82	0.05	1.32	178	0.47	0.010	590	27.51	0.29	<1	13	4	18	<1
9C	2670	4490	2.5	4.49	0.09	1530	15.41	0.09	0.95	177	0.82	0.016	890	25.72	0.44	1	2	2	85	<1
17C	2590	4490	2.5	8.75	0.21	740	23.98	0.09	0.51	224	0.34	0.007	440	16.40	0.50	<1	11	34	93	1
23C	2530	4490	2.5	8.77	0.14	640	33.05	0.06	0.39	141	0.31	0.008	330	10.84	0.43	<1	48	28	73	<1
32C	2440	4490	2.5	5.97	0.54	770	37.31	0.07	0.65	88	0.30	0.010	470	10.64	0.37	2	97	12	201	<1
35C	2410	4490	2.5	6.39	0.11	680	35.55	0.11	0.35	129	0.25	0.014	930	12.86	0.53	<1	69	16	167	<1
39C	2370	4490	2.5	7.39	0.19	1140	17.43	0.27	0.58	143	0.47	0.012	760	22.87	0.51	<1	30	6	170	3
51C	2250	4490	2.5	9.61	0.12	540	9.92	0.53	0.68	127	0.37	0.013	570	24.35	0.61	<1	24	1	268	<1
55C	2210	4490	2.5	8.68	0.04	770	14.98	0.47	0.51	100	0.42	0.014	1090	22.58	0.57	1	30	1	267	1
57C	1900	4200	2.5	7.08	0.06	630	24.12	0.19	0.34	238	0.27	0.013	390	19.89	0.52	5	53	1	537	1
59C	1920	4200	2.5	5.64	0.19	580	41.55	0.08	0.30	340	0.17	0.015	410	11.86	0.67	<1	70	1	318	5
62C	1950	4200	2.5	7.99	0.04	670	21.04	0.28	0.33	142	0.30	0.018	700	20.73	0.54	1	40	1	283	<1
80C	2130	4200	2.5	9.03	0.03	660	14.81	0.41	0.51	112	0.41	0.013	800	22.39	0.59	2	30	1	276	<1
82C	2150	4200	2.5	7.89	0.08	1160	15.08	0.37	0.53	157	0.47	0.013	620	24.06	0.53	<1	28	10	333	2
100C	2330	4200	2.5	8.13	2.50	20	27.81	0.08	1.01	99	0.34	0.011	240	11.78	0.37	8	73	4	286	3
102C	2350	4200	2.5	7.06	1.73	220	31.07	0.06	1.40	184	0.39	0.012	270	11.04	0.32	<1	77	8	180	1
104C	2370	4200	2.5	6.42	4.95	60	24.98	0.04	2.37	126	0.25	0.008	230	10.14	0.35	2	67	22	230	<1
106C	2390	4200	2.5	7.20	0.61	170	38.90	0.05	0.61	103	0.36	0.010	270	9.23	0.49	<1	91	8	175	1
114c	2470	4200	2.5	11.09	0.64	510	25.10	0.03	0.72	266	0.24	0.007	220	12.42	0.46	<1	68	16	12	1
116C	2490	4200	2.5	7.95	0.71	170	13.74	0.03	0.33	150	0.16	0.004	250	24.95	0.33	<1	47	4	33	<1
120C	2200	4705	2.5	8.94	0.04	1050	15.19	0.38	0.49	90	0.44	0.015	770	22.61	0.61	2	26	1	236	<1
124C	2240	4705	2.5	8.37	0.03	840	19.93	0.29	0.37	141	0.32	0.017	790	21.04	0.58	<1	28	1	249	<1
142C	2420	4705	2.5	7.18	0.05	2240	16.50	0.37	0.54	149	0.47	0.011	710	23.71	0.57	1	25	1	167	<1
146C	2460	4705	2.5	7.02	0.21	4270	11.06	0.54	0.88	307	0.75	0.009	520	26.22	0.46	<1	19	14	183	2
150C	2500	4705	2.5	5.46	0.07	780	27.47	0.09	0.40	60	0.32	0.012	1160	17.70	0.42	<1	37	1	132	1
164C	2640	4705	2.5	8.47	0.08	510	18.35	0.17	0.46	72	0.42	0.010	400	20.97	0.53	2	25	32	74	<1
168C	2680	4705	2.5	9.45	0.03	1880	15.51	0.07	0.16	79	0.27	0.009	720	22.96	0.41	1	2	1	35	1
170C	2700	4705	2.5	8.11	0.04	1620	22.62	0.03	0.34	117	0.30	0.009	930	18.24	0.46	3	2	2	22	<1
180C	2200	4875	2.5	8.99	0.04	1510	12.99	0.36	0.39	90	0.39	0.011	710	23.91	0.61	<1	13	1	222	<1
186C	2260	4875	2.5	9.08	0.01	1050	15.40	0.36	0.41	120	0.35	0.014	930	22.10	0.61	<1	19	1	229	<1
208C	2480	4875	2.5	7.80	0.13	1930	14.54	0.59	0.69	359	0.59	0.009	630	23.87	0.52	<1	20	18	205	1
220C	2600	4875	2.5	6.86	0.73	490	26.89	0.09	0.90	93	0.38	0.011	280	15.07	0.50	<1	42	18	96	<1
224C	2640	4875	2.5	8.62	0.11	820	28.15	0.09	0.54	109	0.43	0.009	430	13.33	0.53	5	40	16	91	2
238C	2780	4875	2.5	6.92	0.08	2210	20.98	0.03	0.16	232	0.30	0.014	1030	20.85	0.59	1	11	2	22	1
240C	2800	4875	2.5	5.74	0.15	2020	12.11	0.07	1.09	111	0.47	0.008	650	27.08	0.49	1	5	6	50	<1
1D	2750	4490	3.5	5.67	0.04	940	8.36	0.03	4.08	247	1.30	0.002	480	26.05	0.23	<1	1	24	14	2
17D	2590	4490	3.5	8.84	0.06	1440	21.09	0.07	0.33	58	0.33	0.011	820	19.41	0.58	<1	14	12	119	<1
23D	2530	4490	3.5	8.29	0.04	1210	26.50	0.11	0.46	60	0.44	0.010	360	14.66	0.43	<1	39	1	78	<1
32D	2440	4490	3.5	6.42	0.01	1690	33.56	0.08	0.40	39	0.42	0.010	1120	13.11	0.35	4	96	6	164	1
39D	2370	4490	3.5	9.50	0.11	1420	11.25	0.37	0.63	100	0.54	0.007	830	23.47	0.58	<1	21	32	150	<1
55D	2210	4490	3.5	8.11	0.04	1170	12.51	0.50	0.58	123	0.51	0.010	1000	24.36	0.64	<1	34	1	219	<1
59D	1920	4200	3.5	7.97	0.05	530	20.57	0.26	0.34	173	0.23	0.013	550	21.49	0.63	<1	42	1	166	2
104D	2370	4200	3.5	8.48	0.61	260	27.75	0.07	0.67	69	0.47	0.013	360	13.60	0.46	2	74	90	340	2
164D	2640	4705	3.5	6.72	0.03	220	22.48	0.03	0.11	102	0.16	0.009	1190	20.51	0.60	2	20	28	105	<1
208D	2480	4875	3.5	7.39	0.04	1920	16.44	0.44	0.58	124	0.56	0.011	820	22.59	0.57	<1	31	1	158	<1
220D	2600	4875	3.5	7.50	0.07	790	31.10	0.06	0.36	94	0.32	0.011	370	13.22	0.73	<1	39	6	60	1
224D	2640	4875	3.5	8.87	0.04	820	25.97	0.09	0.38	74	0.39	0.011	620	14.57	0.62	<1	30	6	72	<1
240D	2800	4875	3.5	7.40	0.04	2240	13.06	0.05	0.67	239	0.45	0.007	730	25.15	0.52	<1	6	1	39	<1
1E	2750	4490	4.5	5.68	0.03	1080	7.71	0.02	3.94	257	1.39	0.005	410	26.33	0.22	<1	1	8	20	<1
39E	2370	4490	4.5	9.55	0.02	1650	16.40	0.31	0.45	75	0.51	0.008	1060	20.60	0.61	<1	36	1	101	<1
59E	1920	4200	4.5	8.60	0.02	710	13.26	0.35	0.37	98	0.30	0.014	640	24.55	0.73	<1	22	1	226	<1
104E	2370	4200	4.5	9.50	0.02	260	27.68	0.04	0.22	34	0.40	0.014	450	13.39	0.45	1	76	16	67	<1
240E	2800	4875	4.5	7.38	0.03	2580	17.31	0.02	0.41	209	0.36	0.011	990	22.86	0.59	<1	8	1	29	<1

Drill, lag and topsoil chemical data (continued)

No.	E	N	DEPTH	Al xrf %	Ca xrf %	Cl xrf ppm	Fe xrf %	K xrf %	Mg xrf %	Mn xrf(tr) ppm	Na xrf %	P xrf %	S xrf ppm	Si xrf %	Ti xrf(tr) %	Ag xrf(tr) ppm	As xrf(tr) ppm	Au inaa ppb	Ba xrf(tr) ppm	Bi xrf(tr) ppm
4200	2700	4705	LAG	5.27	2.97	<50	41.38	0.08	0.96	909	0.03	0.017	250	7.50	0.38	4	60	12	221	<1
4201	2650	4705	LAG	5.66	1.96	20	43.92	0.06	0.70	708	0.01	0.018	180	6.33	0.47	<1	51	22	117	<1
4202	2600	4705	LAG	5.46	0.79	<40	51.57	0.03	0.31	593	0.50	0.020	150	4.83	0.54	<1	69	4	92	1
4203	2550	4705	LAG	5.05	0.07	<10	54.41	0.04	0.12	528	0.01	0.022	160	4.92	0.58	<1	63	16	52	<1
4204	2500	4705	LAG	4.87	0.11	<20	46.78	0.07	0.13	698	0.03	0.021	150	9.54	0.58	5	62	8	86	1
4205	2450	4705	LAG	4.45	0.06	10	42.14	0.07	0.13	603	0.04	0.026	200	13.00	0.56	<1	53	1	103	1
4206	2400	4705	LAG	4.05	0.05	<20	40.08	0.07	0.08	496	0.04	0.023	180	15.25	0.59	<1	41	4	76	3
4207	2350	4705	LAG	4.21	0.05	<20	42.47	0.05	0.08	594	0.01	0.026	170	13.13	0.62	4	52	34	85	1
4208	2300	4705	LAG	4.38	0.07	<10	42.80	0.05	0.10	544	0.01	0.021	180	12.62	0.75	3	56	1	102	1
4209	2250	4705	LAG	3.64	0.16	<10	29.76	0.07	0.13	499	0.01	0.019	130	22.31	0.43	<1	42	62	78	<1
4210	2200	4705	LAG	4.21	0.08	<20	36.42	0.06	0.13	650	0.04	0.022	130	16.98	0.56	1	59	1	78	3
4270	2700	4705	TOPSOIL	5.55	3.49	130	14.02	0.53	1.56	775	0.15	0.019	170	22.75	0.37	<1	17	36	147	1
4271	2650	4705	TOPSOIL	5.14	1.97	10	19.41	0.41	1.03	561	0.10	0.019	230	21.52	0.43	<1	18	56	137	<1
4272	2600	4705	TOPSOIL	5.22	2.24	<20	25.76	0.31	0.73	501	0.07	0.022	110	18.29	0.47	2	31	38	131	<1
4273	2550	4705	TOPSOIL	5.61	0.21	<10	22.31	0.36	0.37	621	0.09	0.024	110	22.80	0.50	<1	29	22	139	<1
4274	2500	4705	TOPSOIL	5.43	0.25	20	19.67	0.35	0.41	693	0.11	0.018	100	24.94	0.51	<1	25	20	154	<1
4275	2450	4705	TOPSOIL	3.93	0.16	10	14.02	0.36	0.27	628	0.16	0.024	120	30.58	0.39	<1	17	10	137	<1
4276	2400	4705	TOPSOIL	4.73	0.18	200	19.77	0.37	0.36	769	0.16	0.021	80	26.19	0.52	<1	14	8	130	1
4277	2350	4705	TOPSOIL	6.62	0.37	<10	11.14	0.68	0.80	1144	0.16	0.021	140	27.73	0.47	<1	14	18	182	<1
4278	2300	4705	TOPSOIL	7.19	0.33	280	12.74	0.62	0.63	906	0.26	0.017	150	26.32	0.50	3	14	14	185	<1
4279	2250	4705	TOPSOIL	3.34	0.14	<10	11.62	0.36	0.24	667	0.16	0.017	130	33.68	0.38	<1	16	6	140	1
4280	2200	4705	TOPSOIL	6.81	0.26	30	10.18	0.75	0.55	1204	0.21	0.025	290	28.71	0.55	<1	20	34	232	<1
4292	2750	4490	TOPSOIL	5.08	2.49	<10	11.65	0.60	2.35	1024	0.24	0.017	170	25.06	0.35	2	13	50	133	1
4293	2700	4490	TOPSOIL	4.39	4.08	50	11.22	0.52	1.64	871	0.21	0.018	190	25.02	0.34	1	10	44	145	1
4294	2650	4490	TOPSOIL	5.54	1.52	220	10.22	0.71	1.80	1031	0.22	0.017	140	27.20	0.36	<1	13	40	151	<1
4295	2600	4490	TOPSOIL	4.84	4.68	20	15.74	0.39	1.18	727	0.09	0.020	190	21.64	0.41	1	18	80	129	<1
4296	2550	4490	TOPSOIL	4.74	4.70	<20	22.48	0.27	0.75	530	0.07	0.016	170	17.85	0.43	<1	26	74	120	3
4297	2500	4490	TOPSOIL	4.06	0.25	10	20.63	0.25	0.25	458	0.09	0.020	90	26.70	0.44	<1	29	22	114	1
4298	2450	4490	TOPSOIL	4.23	0.10	<10	19.95	0.29	0.21	666	0.10	0.024	90	27.26	0.50	<1	22	14	135	<1
4299	2400	4490	TOPSOIL	4.35	0.16	40	21.55	0.33	0.34	722	0.17	0.021	170	25.61	0.52	<1	24	10	126	<1
4300	2350	4490	TOPSOIL	6.11	0.27	80	10.25	0.72	0.58	1216	0.27	0.022	220	29.48	0.51	<1	13	24	214	<1
4301	2300	4490	TOPSOIL	4.23	0.43	10	12.49	0.43	0.43	834	0.22	0.021	160	31.37	0.46	<1	19	8	142	<1
4302	2250	4490	TOPSOIL	5.63	0.24	20	13.51	0.47	0.40	820	0.15	0.023	190	28.60	0.47	1	17	12	162	<1
4303	2200	4490	TOPSOIL	5.87	0.25	30	12.86	0.58	0.51	1070	0.19	0.021	210	28.79	0.50	2	17	14	195	<1
4340	1900	4200	TOPSOIL	3.23	0.14	<20	13.68	0.29	0.19	507	0.13	0.020	100	32.42	0.41	2	10	2	94	<1
4341	1950	4200	TOPSOIL	4.11	0.11	50	13.19	0.32	0.23	688	0.14	0.021	100	31.44	0.44	<1	14	2	95	<1
4342	2000	4200	TOPSOIL	4.26	0.13	70	15.65	0.29	0.26	511	0.13	0.023	90	29.63	0.44	<1	26	4	87	<1
4343	2050	4200	TOPSOIL	4.71	0.19	20	13.53	0.38	0.35	777	0.16	0.021	100	30.13	0.47	1	12	4	135	<1
4344	2100	4200	TOPSOIL	5.72	0.21	420	10.62	0.52	0.51	844	0.29	0.019	110	30.01	0.52	<1	13	1	137	1
4345	2150	4200	TOPSOIL	3.62	0.17	10	12.38	0.33	0.30	631	0.21	0.019	80	32.38	0.44	1	15	4	124	<1
4346	2200	4200	TOPSOIL	6.79	0.36	60	9.34	0.77	0.75	1156	0.28	0.023	180	28.66	0.56	<1	18	18	225	1
4347	2250	4200	TOPSOIL	6.83	0.43	40	10.32	0.70	0.73	1176	0.20	0.031	330	26.23	0.49	<1	17	28	216	<1
4348	2300	4200	TOPSOIL	6.35	0.29	10	11.96	0.58	0.54	894	0.16	0.024	240	27.54	0.48	1	16	16	168	2
4349	2350	4200	TOPSOIL	8.06	0.36	20	10.37	0.80	0.74	1194	0.17	0.027	360	25.35	0.51	2	25	42	235	<1
4350	2400	4200	TOPSOIL	7.23	0.26	<10	11.10	0.64	0.52	1209	0.15	0.030	210	27.24	0.49	<1	21	20	193	<1
4351	2450	4200	TOPSOIL	5.51	0.26	<10	23.74	0.26	0.25	419	0.08	0.019	230	22.54	0.56	<1	46	26	100	1
4352	2500	4200	TOPSOIL	5.23	5.70	30	17.41	0.25	0.51	372	0.07	0.015	270	18.68	0.37	<1	33	42	118	2
4366	2200	4875	TOPSOIL	5.77	0.21	350	11.04	0.57	0.48	1041	0.24	0.021	150	29.78	0.49	4	12	16	196	<1
4367	2250	4875	TOPSOIL	5.97	0.43	<10	14.79	0.63	0.66	741	0.13	0.021	180	26.28	0.45	1	17	8	204	<1
4368	2300	4875	TOPSOIL	4.12	0.12	<10	20.64	0.30	0.20	628	0.11	0.021	100	27.02	0.50	2	19	4	138	<1
4369	2350	4875	TOPSOIL	5.34	0.22	<20	16.45	0.42	0.31	926	0.12	0.019	90	27.54	0.52	<1	20	6	181	<1
4370	2400	4875	TOPSOIL	5.32	0.23	<40	18.28	0.45	0.36	805	0.13	0.018	100	26.17	0.54	1	24	6	185	1
4371	2450	4875	TOPSOIL	4.59	0.29	<10	22.65	0.36	0.37	818	0.10	0.017	100	24.28	0.52	1	18	8	144	<1
4372	2500	4875	TOPSOIL	6.12	0.85	20	15.78	0.83	0.83	900	0.14	0.019	140	24.89	0.46	<1	16	14	150	<1
4373	2550	4875	TOPSOIL	5.46	0.71	30	29.35	0.36	0.45	777	0.10	0.019	180	18.03	0.50	1	37	14	122	1
4374	2600	4875	TOPSOIL	4.45	0.15	<40	29.24	0.25	0.19	460	0.10	0.020	90	20.63	0.55	<1	36	14	99	1
4375	2650	4875	TOPSOIL	4.70	4.73	<10	25.81	0.26	0.93	444	0.07	0.017	200	14.77	0.40	<1	40	28	110	1
4376	2700	4875	TOPSOIL	4.94	4.74	10	19.74	0.44	1.13	541	0.07	0.021	240	18.40	0.37	1	33	34	126	<1
4377	2750	4875	TOPSOIL	5.13	5.56	20	13.93	0.50	1.81	823	0.12	0.021	210	20.04	0.37	1	13	34	137	1
4378	2800	4875	TOPSOIL	4.83	4.57	30	14.86	0.46	2.06	933	0.14	0.022	280	21.02	0.38	<1	13	28	154	<1

Drill, lag and topsoil chemical data (continued)

No.	E	N	DEPTH	Cd xrf(tr) ppm	Ce xrf(tr) ppm	Co xrf(tr) ppm	Cr xrf(tr) ppm	Cs xrf(tr) ppm	Cu xrf(tr) ppm	Ga xrf(tr) ppm	Ge xrf(tr) ppm	In xrf(tr) ppm	La xrf(tr) ppm	Mo xrf(tr) ppm	Nb xrf(tr) ppm	Nd xrf(tr) ppm	Ni xrf(tr) ppm	Pb xrf(tr) ppm	Rb xrf(tr) ppm
1A	2750	4490	0.5	1	22	61	1332	<1	57	14	1	2	14	<1	5	8	344	11	23
5A	2710	4490	0.5	2	19	24	1395	<1	57	12	1	3	9	1	2	<1	215	6	17
9A	2670	4490	0.5	1	23	30	1274	<1	58	12	1	4	19	1	3	7	201	6	20
17A	2590	4490	0.5	<1	14	40	1541	<1	83	13	2	5	11	6	5	1	245	6	5
19A	2570	4490	0.5	2	17	50	2047	<1	87	14	1	<1	12	1	<1	3	258	4	9
21A	2550	4490	0.5	<1	12	29	1939	<1	59	11	<1	<1	17	1	2	5	226	6	8
23A	2530	4490	0.5	1	17	37	5778	<1	64	16	1	6	12	3	<1	<1	303	9	3
30A	2460	4490	0.5	<1	39	30	1173	<1	64	18	<1	<1	20	2	5	14	184	10	31
32A	2440	4490	0.5	<1	35	32	1039	<1	69	18	<1	<1	27	2	4	17	207	7	36
35A	2410	4490	0.5	1	41	38	1364	<1	85	25	1	<1	35	<1	4	21	224	11	35
39A	2370	4490	0.5	2	40	31	1533	<1	74	18	<1	<1	32	5	2	8	161	11	16
41A	2350	4490	0.5	<1	40	30	1047	<1	73	20	1	2	23	2	5	17	166	13	32
51A	2250	4490	0.5	2	37	33	1905	<1	84	21	<1	2	36	<1	4	23	164	13	16
53A	2230	4490	0.5	1	37	26	1628	<1	87	22	<1	7	35	<1	4	16	167	14	22
55A	2210	4490	0.5	2	44	29	1953	<1	78	21	1	<1	37	2	5	11	153	19	16
57A	1900	4200	0.5	<1	24	24	1298	<1	53	15	2	2	26	<1	5	11	113	10	12
59A	1920	4200	0.5	1	30	27	1465	<1	66	16	1	4	27	2	1	17	119	9	8
62A	1950	4200	0.5	<1	32	30	1309	<1	76	18	2	3	34	<1	4	18	147	12	20
76A	2090	4200	0.5	2	28	27	796	<1	60	18	2	1	21	2	5	12	146	10	32
78A	2110	4200	0.5	2	41	27	695	<1	71	19	2	4	22	2	6	18	172	7	43
80A	2130	4200	0.5	<1	43	38	1038	<1	79	22	1	4	30	2	3	18	182	13	38
82A	2150	4200	0.5	<1	38	29	899	<1	69	18	2	5	28	<1	5	14	164	13	30
83A	2160	4200	0.5	3	35	27	1119	<1	66	18	<1	<1	21	2	7	13	154	11	25
86A	2190	4200	0.5	3	38	23	865	<1	66	17	1	<1	29	3	6	18	162	9	30
100A	2330	4200	0.5	<1	35	32	1041	<1	66	19	1	<1	25	7	5	14	147	7	24
102A	2350	4200	0.5	4	38	33	1334	<1	75	20	1	<1	30	7	3	17	157	14	26
104A	2370	4200	0.5	2	40	28	1460	1	87	23	1	1	30	9	3	13	162	14	25
106A	2390	4200	0.5	6	42	32	1222	<1	80	20	1	2	33	3	3	16	177	12	29
113A	2460	4200	0.5	1	14	63	3956	<1	67	32	1	<1	16	17	3	<1	282	<1	3
114A	2470	4200	0.5	1	16	104	4963	<1	90	29	2	2	18	2	3	<1	406	<1	1
116A	2490	4200	0.5	2	11	16	1676	<1	68	8	<1	3	13	4	3	1	137	2	6
117A	2500	4200	0.5	1	18	63	4881	<1	153	19	2	4	12	2	1	<1	270	5	5
120A	2200	4705	0.5	1	44	32	1243	<1	84	21	<1	<1	29	2	2	18	164	12	24
122A	2220	4705	0.5	<1	33	30	778	<1	75	17	<1	3	21	2	3	18	154	12	33
124A	2240	4705	0.5	3	39	25	1166	<1	77	19	1	3	25	1	4	18	152	9	27
125A	2250	4705	0.5	1	43	30	1136	<1	80	22	1	<1	28	<1	6	14	161	14	34
142A	2420	4705	0.5	1	14	19	1227	<1	59	21	1	1	14	2	3	1	141	5	27
144A	2440	4705	0.5	<1	48	37	1288	<1	75	22	<1	1	36	1	4	19	222	10	40
146A	2460	4705	0.5	<1	39	33	1293	<1	70	18	<1	2	25	2	3	14	207	11	34
148A	2480	4705	0.5	2	33	21	1125	<1	61	14	<1	<1	20	<1	2	12	175	9	20
150A	2500	4705	0.5	<1	36	35	2481	<1	80	20	1	<1	20	3	3	12	225	9	19
159A	2590	4705	0.5	3	19	40	4217	<1	94	17	<1	4	13	3	<1	<1	248	8	6
161A	2610	4705	0.5	2	13	29	2782	<1	67	13	1	<1	8	<1	<1	2	201	4	3
162A	2620	4705	0.5	<1	12	37	5338	<1	72	16	2	1	12	2	<1	<1	206	2	4
163A	2630	4705	0.5	4	7	36	1240	<1	90	11	<1	<1	10	<1	<1	4	185	1	4
164A	2640	4705	0.5	2	26	76	1619	<1	127	15	1	2	13	<1	<1	1	262	7	5
166A	2660	4705	0.5	2	15	40	2802	<1	86	14	<1	<1	12	<1	1	3	209	<1	5
168A	2680	4705	0.5	<1	19	49	1895	<1	82	16	1	5	16	<1	2	12	210	5	13
170A	2700	4705	0.5	<1	15	35	1456	<1	131	13	1	<1	12	2	<1	2	186	3	7
180A	2200	4875	0.5	<1	36	30	950	<1	73	20	2	4	25	1	5	12	161	13	36
183A	2230	4875	0.5	4	38	31	1149	<1	74	21	1	1	27	2	7	11	163	12	34
186A	2260	4875	0.5	4	32	34	1676	<1	85	27	1	<1	26	<1	2	8	161	11	25
204A	2440	4875	0.5	1	34	21	917	<1	65	17	2	<1	22	2	5	15	145	11	30
206A	2460	4875	0.5	1	35	28	879	<1	60	17	<1	<1	24	2	5	17	150	7	29
208A	2480	4875	0.5	2	32	22	852	<1	61	18	2	6	24	<1	6	10	152	11	32
210A	2500	4875	0.5	1	36	31	1067	<1	62	20	2	<1	18	1	6	22	168	13	34
212A	2520	4875	0.5	4	42	28	1537	<1	67	18	<1	<1	21	<1	4	10	174	13	28
220A	2600	4875	0.5	<1	26	40	6151	<1	103	18	1	<1	18	3	2	2	298	5	9
221A	2610	4875	0.5	<1	21	33	4713	<1	81	16	1	1	16	<1	2	<1	264	<1	8
222A	2620	4875	0.5	3	21	49	5353	<1	89	19	<1	2	10	2	1	<1	300	3	6
223A	2630	4875	0.5	6	18	45	5864	<1	84	18	1	<1	21	3	3	<1	299	1	7
224A	2640	4875	0.5	<1	20	62	6185	<1	112	20	<1	<1	16	<1	<1	<1	389	2	6
225A	2650	4875	0.5	<1	15	59	6327	<1	88	18	1	<1	7	<1	1	<1	335	3	5
226A	2660	4875	0.5	3	15	61	5357	<1	74	17	<1	<1	13	<1	<1	<1	280	<1	5
237A	2770	4875	0.5	<1	20	47	1767	<1	64	14	1	2	18	3	1	1	271	2	11
238A	2780	4875	0.5	2	38	122	3065	<1	96	18	2	<1	27	3	<1	9	490	5	11
239A	2790	4875	0.5	1	34	205	2712	<1	110	18	1	2	20	2	2	5	884	6	13
240A	2800	4875	0.5	<1	20	32	1815	<1	63	11	2	3	20	3	2	5	319	5	13
1B	2750	4490	1.5	2	20	84	1570	<1	61	14	1	5	17	<1	3	9	425	13	22
5B	2710	4490	1.5	2	14	56	2321	<1	55	13	1	1	14	1	<1	1	346	3	6
9B	2670	4490	1.5	<1	20	79	1678	<1	58	17	<1	<1	16	<1	1	9	371	4	11
17B	2590	4490	1.5	2	27	105	1025	<1	113	17	1	1	19	<1	<1	<1	272	3	4
19B	2570	4490	1.5	<1	21	100	1492	<1	109	18	<1	<1	18	<1	<1	2	289	6	4
21B	2550	4490	1.5	2	16	75	4089	<1	84	18	1	<1	22	<1	<1	<1	394	2	<1
23B	2530	4490	1.5	5	10	83	8378	<1	81	29	<1	4	19	2	<1	<1	464	7	1
32B	2440	4490	1.5	3	32	43	4188	<1	78	21	<1	<1	22	<1	4	6	310	8	9
35B	2410	4490	1.5	3	37	35	2145	<1	82	20	<1	<1	32	<1	3	15	192	19	12
39B	2370	4490	1.5	2	42	40	1109	<1	49	14	1	2	40	2	4	23	271	13	13
41B	2350	4490	1.5	<1	60	59	1888	<1	83	24	2	2	49	2	5	28	228	14	13
51B	2250	4490	1.5	1	44	48	1707	<1	73	24	2	3	45	<1	4	18	181	7	12
53B	2230	4490	1.5	<1	53	32	2252	<1	81	25	<1	<1	55	3	<1	34	173	17	6
55B	2210	4490	1.5	<1	33	33	1804	<1	78	26	2	5	19	2	4	3	141	11	15
57B	1900	4200	1.5	1	25	20	2478	<1	84	28	<1	3	21	<1	2	<1	132	18	7
59B	1920	4200	1.5	3	32	34	2053	<1	75	21	1	3	27	2	1	13	123	13	6
62B	1950	4200	1.5	5	27	110	2424	<1	108	23	<1	4	35	<1	4	9	149	13	8

Drill, lag and topsoil chemical data (continued)

No.	E	N	DEPTH	Cd xrf(tr) ppm	Ce xrf(tr) ppm	Co xrf(tr) ppm	Cr xrf(tr) ppm	Cs xrf(tr) ppm	Cu xrf(tr) ppm	Ga xrf(tr) ppm	Ge xrf(tr) ppm	In xrf(tr) ppm	La xrf(tr) ppm	Mo xrf(tr) ppm	Nb xrf(tr) ppm	Nd xrf(tr) ppm	Ni xrf(tr) ppm	Pb xrf(tr) ppm	Rb xrf(tr) ppm
76B	2090	4200	1.5	2	18	26	1137	<1	52	18	2	5	21	2	3	8	123	11	18
78B	2110	4200	1.5	1	50	39	1510	1	81	22	2	<1	35	1	15	22	181	13	20
80B	2130	4200	1.5	<1	14	23	1704	<1	50	20	1	3	11	2	4	<1	108	6	17
82B	2150	4200	1.5	3	30	35	1866	<1	76	21	1	<1	36	1	5	9	153	10	13
86B	2190	4200	1.5	2	39	21	1753	1	78	21	2	1	36	1	2	21	147	14	7
100B	2330	4200	1.5	1	32	42	2842	<1	93	23	1	1	23	2	1	7	188	10	8
102B	2350	4200	1.5	1	37	37	2363	<1	83	22	1	<1	30	2	3	9	172	11	6
104B	2370	4200	1.5	2	39	32	3085	<1	82	26	<1	4	32	<1	1	15	187	11	6
106B	2390	4200	1.5	1	23	38	3335	<1	64	29	<1	4	20	1	1	5	164	9	3
114B	2470	4200	1.5	2	14	69	3739	<1	74	28	<1	2	13	3	2	<1	298	<1	4
116B	2490	4200	1.5	5	14	38	2782	<1	99	14	<1	4	17	3	<1	1	189	1	3
120B	2200	4705	1.5	<1	25	26	1697	<1	67	24	2	<1	20	<1	3	4	142	7	13
124B	2240	4705	1.5	2	24	29	1879	<1	87	25	<1	3	14	<1	3	<1	132	13	14
142B	2420	4705	1.5	3	54	44	1042	<1	69	19	<1	3	32	4	5	14	224	13	33
146B	2460	4705	1.5	4	41	33	1235	<1	65	19	<1	<1	26	<1	5	20	204	7	30
150B	2500	4705	1.5	2	35	56	5832	<1	107	26	<1	<1	18	<1	<1	3	281	10	6
162B	2620	4705	1.5	1	14	54	1335	<1	72	16	1	1	10	<1	1	<1	231	3	3
164B	2640	4705	1.5	2	21	76	1563	<1	90	17	1	5	16	2	1	<1	229	4	4
166B	2660	4705	1.5	<1	17	49	4643	<1	81	22	2	1	15	2	<1	<1	277	4	<1
168B	2680	4705	1.5	<1	8	27	1481	<1	76	18	2	2	11	<1	1	2	168	2	4
170B	2700	4705	1.5	3	12	56	1775	<1	87	17	1	4	9	<1	<1	1	196	<1	4
180B	2200	4875	1.5	2	12	23	1635	<1	57	25	2	4	20	5	4	<1	115	5	17
186B	2260	4875	1.5	<1	13	11	1372	<1	54	22	2	<1	13	2	1	<1	117	6	20
204B	2440	4875	1.5	<1	31	30	1794	<1	61	24	2	1	22	<1	3	4	157	7	13
208B	2480	4875	1.5	4	42	33	930	<1	53	19	2	<1	23	3	7	14	173	8	33
212B	2520	4875	1.5	4	36	31	1229	<1	60	16	2	<1	20	1	5	11	175	10	30
220B	2600	4875	1.5	<1	18	51	6969	<1	81	24	2	1	14	3	1	<1	269	1	4
224B	2640	4875	1.5	<1	10	83	8037	<1	101	24	1	5	10	1	2	<1	451	2	2
238B	2780	4875	1.5	<1	13	44	4584	<1	108	32	3	2	11	<1	<1	<1	379	1	4
240B	2800	4875	1.5	1	18	113	4049	<1	95	20	2	2	15	3	<1	<1	980	1	7
1C	2750	4490	2.5	2	6	64	1821	<1	57	13	1	1	11	<1	2	2	338	9	12
5C	2710	4490	2.5	2	5	19	2374	<1	40	17	1	<1	8	1	2	<1	179	1	3
9C	2670	4490	2.5	3	6	23	2242	<1	61	22	1	1	8	3	2	<1	202	2	6
17C	2590	4490	2.5	2	26	90	928	<1	85	19	<1	3	12	<1	3	2	199	1	3
23C	2530	4490	2.5	3	16	99	7150	<1	90	30	1	3	20	<1	<1	<1	465	2	1
32C	2440	4490	2.5	2	7	68	7858	<1	77	22	2	<1	20	<1	1	<1	362	8	5
35C	2410	4490	2.5	<1	14	76	7819	<1	87	25	<1	3	18	<1	3	<1	421	12	5
39C	2370	4490	2.5	<1	8	13	1897	<1	52	24	1	<1	10	3	5	<1	157	9	17
51C	2250	4490	2.5	1	9	16	1453	<1	57	27	2	2	10	3	9	<1	145	2	25
55C	2210	4490	2.5	2	11	12	1618	<1	54	23	1	<1	15	2	10	<1	113	5	23
57C	1900	4200	2.5	2	12	12	1868	<1	60	23	2	<1	14	1	3	3	122	11	11
59C	1920	4200	2.5	2	25	20	3653	<1	73	29	<1	3	17	1	2	<1	146	19	4
62C	1950	4200	2.5	3	5	14	1813	<1	51	22	1	<1	15	3	5	<1	104	5	14
80C	2130	4200	2.5	1	15	17	1584	<1	43	24	2	<1	12	3	7	<1	122	2	23
82C	2150	4200	2.5	1	16	15	1434	<1	43	22	1	<1	20	1	6	3	118	6	19
100C	2330	4200	2.5	7	17	44	3537	<1	102	24	1	<1	12	2	1	<1	183	7	4
102C	2350	4200	2.5	2	40	58	3013	<1	122	20	<1	1	18	<1	<1	3	187	8	4
104C	2370	4200	2.5	<1	22	48	3153	<1	82	20	<1	3	15	2	2	<1	181	4	1
106C	2390	4200	2.5	2	22	61	5451	<1	92	34	1	<1	27	4	3	6	225	5	1
114c	2470	4200	2.5	1	23	149	4908	<1	125	28	1	5	11	<1	<1	<1	540	1	1
116C	2490	4200	2.5	<1	7	32	2361	<1	100	14	1	<1	8	1	<1	<1	185	1	2
120C	2200	4705	2.5	1	10	21	1479	<1	62	25	1	<1	11	2	4	3	132	5	20
124C	2240	4705	2.5	1	17	26	1474	<1	82	27	2	<1	15	1	4	<1	126	6	14
142C	2420	4705	2.5	<1	14	19	1716	<1	46	25	2	<1	14	1	7	<1	135	7	22
146C	2460	4705	2.5	2	39	46	1184	1	61	18	2	2	15	<1	6	10	241	11	33
150C	2500	4705	2.5	1	16	36	3850	<1	54	20	3	2	11	5	2	<1	177	7	7
164C	2640	4705	2.5	<1	11	37	1869	<1	71	19	1	3	6	<1	1	10	169	7	9
168C	2680	4705	2.5	1	4	25	1678	<1	76	19	1	1	10	2	2	1	117	<1	5
170C	2700	4705	2.5	<1	9	46	3596	<1	137	22	1	<1	11	<1	2	<1	245	<1	1
180C	2200	4875	2.5	1	6	17	1005	<1	45	25	2	<1	12	2	5	<1	105	<1	19
186C	2260	4875	2.5	<1	8	19	1316	<1	48	26	1	<1	7	2	7	1	119	4	19
208C	2480	4875	2.5	<1	31	33	1257	<1	55	22	2	4	24	<1	4	15	177	12	31
220C	2600	4875	2.5	<1	16	48	6095	<1	65	25	3	3	12	2	6	<1	272	2	5
224C	2640	4875	2.5	1	18	83	7088	<1	76	24	1	3	13	3	4	<1	380	2	6
238C	2780	4875	2.5	<1	10	38	3924	<1	108	26	<1	7	10	1	<1	<1	305	<1	4
240C	2800	4875	2.5	2	3	42	3615	<1	68	16	<1	2	10	1	<1	<1	415	1	3
1D	2750	4490	3.5	<1	1	54	2180	<1	61	13	2	1	3	<1	1	<1	352	3	1
17D	2590	4490	3.5	1	0	20	783	<1	45	21	1	3	6	2	4	<1	75	3	5
23D	2530	4490	3.5	4	15	46	5115	<1	53	23	<1	1	8	1	<1	<1	268	5	4
32D	2440	4490	3.5	<1	7	33	5100	<1	39	19	<1	<1	14	<1	3	<1	236	3	4
39D	2370	4490	3.5	<1	1	22	1949	<1	42	25	1	3	9	5	10	<1	220	7	19
55D	2210	4490	3.5	<1	4	20	1689	<1	64	27	1	2	10	2	10	<1	153	4	22
59D	1920	4200	3.5	<1	11	20	1909	<1	50	27	1	2	15	5	8	<1	110	9	13
104D	2370	4200	3.5	<1	16	43	3126	<1	74	24	1	<1	14	1	3	<1	197	5	3
164D	2640	4705	3.5	<1	10	43	1589	<1	118	22	2	4	9	1	3	<1	163	<1	2
208D	2480	4875	3.5	3	15	14	1634	<1	36	25	1	6	14	3	6	3	131	2	23
220D	2600	4875	3.5	1	15	54	7054	<1	59	26	1	<1	7	1	5	<1	286	<1	4
224D	2640	4875	3.5	<1	14	60	6129	<1	55	27	1	1	5	2	6	<1	351	<1	3
240D	2800	4875	3.5	3	1	26	3498	<1	70	21	2	2	10	<1	3	<1	300	<1	2
1E	2750	4490	4.5	1	4	59	2117	<1	81	11	2	4	2	1	<1	<1	360	8	1
39E	2370	4490	4.5	1	13	27	3029	1	44	26	2	1	11	5	8	<1	257	5	17
59E	1920	4200	4.5	1	11	18	1253	<1	39	25	<1	4	7	2	10	<1	92	7	16
104E	2370	4200	4.5	3	10	41	2527	<1	66	24	<1	4	11	1	1	<1	208	3	4
240E	2800	4875	4.5	<1	7	22	4320	<1	71	26	1	<1	5	2	<1	<1	261	<1	2

Drill, lag and topsoil chemical data (continued)

No.	E	N	DEPTH	Cd xrf(tr) ppm	Ce xrf(tr) ppm	Co xrf(tr) ppm	Cr xrf(tr) ppm	Cs xrf(tr) ppm	Cu xrf(tr) ppm	Ga xrf(tr) ppm	Ge xrf(tr) ppm	In xrf(tr) ppm	La xrf(tr) ppm	Mo xrf(tr) ppm	Nb xrf(tr) ppm	Nd xrf(tr) ppm	Ni xrf(tr) ppm	Pb xrf(tr) ppm	Rb xrf(tr) ppm
4200	2700	4705	LAG	2	32	88	7692	<1	144	25	1	1	17	<1	<1	1	303	15	3
4201	2650	4705	LAG	1	45	67	8849	<1	126	30	<1	3	12	2	<1	4	326	13	3
4202	2600	4705	LAG	3	43	69	12301	3	100	32	<1	<1	14	4	<1	4	298	14	2
4203	2550	4705	LAG	<1	48	125	11554	1	92	35	<1	6	<1	7	<1	<1	273	19	1
4204	2500	4705	LAG	3	46	2	6128	<1	87	31	<1	<1	<1	2	<1	6	193	22	5
4205	2450	4705	LAG	2	50	<1	3726	<1	81	29	1	<1	91	1	4	10	150	23	4
4206	2400	4705	LAG	1	36	29	3043	<1	70	27	<1	<1	28	<1	<1	10	117	20	1
4207	2350	4705	LAG	2	37	18	3437	1	75	28	<1	<1	29	3	1	12	119	23	3
4208	2300	4705	LAG	<1	44	<1	3662	1	80	31	<1	4	41	<1	3	8	124	22	2
4209	2250	4705	LAG	1	32	28	2278	1	67	22	<1	<1	28	2	3	6	110	15	3
4210	2200	4705	LAG	<1	44	24	3028	1	74	27	<1	<1	35	1	<1	16	119	18	4
4270	2700	4705	TOPSOIL	2	31	22	1937	<1	73	17	1	<1	10	2	4	6	254	8	26
4271	2650	4705	TOPSOIL	<1	28	48	2854	<1	70	16	<1	1	13	<1	2	7	232	10	20
4272	2600	4705	TOPSOIL	<1	37	97	4713	2	73	23	<1	3	20	<1	1	8	231	10	18
4273	2550	4705	TOPSOIL	4	37	55	3514	1	63	21	<1	<1	24	2	4	6	231	13	24
4274	2500	4705	TOPSOIL	1	41	36	2243	2	70	20	<1	1	24	2	4	12	207	13	24
4275	2450	4705	TOPSOIL	<1	32	36	1126	<1	56	14	<1	3	20	2	4	11	129	11	25
4276	2400	4705	TOPSOIL	2	39	26	1618	<1	59	19	1	<1	31	<1	5	13	148	14	25
4277	2350	4705	TOPSOIL	4	43	33	877	1	75	20	1	<1	29	<1	5	21	169	11	47
4278	2300	4705	TOPSOIL	<1	43	31	1014	3	83	21	1	<1	30	1	6	22	180	14	48
4279	2250	4705	TOPSOIL	<1	28	21	931	1	46	11	<1	1	16	1	3	10	94	11	20
4280	2200	4705	TOPSOIL	1	46	35	775	2	80	19	2	5	30	5	7	20	163	13	49
4292	2750	4490	TOPSOIL	6	32	37	1567	1	65	15	1	3	6	1	5	9	310	10	33
4293	2700	4490	TOPSOIL	2	29	41	1495	2	63	12	1	<1	28	1	3	7	244	9	28
4294	2650	4490	TOPSOIL	<1	37	32	1223	<1	74	17	1	2	28	3	4	14	256	9	37
4295	2600	4490	TOPSOIL	1	24	21	1733	1	68	14	1	<1	24	1	1	9	165	11	21
4296	2550	4490	TOPSOIL	<1	24	21	3823	1	67	19	<1	7	16	<1	4	4	240	7	16
4297	2500	4490	TOPSOIL	1	25	19	2340	<1	55	20	<1	6	21	2	4	6	158	12	15
4298	2450	4490	TOPSOIL	2	36	13	1931	<1	58	16	<1	<1	26	<1	2	11	142	11	20
4299	2400	4490	TOPSOIL	<1	36	26	1478	1	68	18	<1	2	26	<1	4	10	127	15	22
4300	2350	4490	TOPSOIL	<1	39	35	874	3	65	18	1	<1	28	1	8	15	163	12	43
4301	2300	4490	TOPSOIL	5	36	23	946	1	48	15	2	4	23	1	4	12	120	12	28
4302	2250	4490	TOPSOIL	<1	36	25	1058	3	65	19	2	<1	23	<1	9	14	147	13	31
4303	2200	4490	TOPSOIL	4	47	32	992	1	72	19	2	3	29	1	6	15	164	15	36
4340	1900	4200	TOPSOIL	1	24	20	1045	1	47	12	<1	3	16	<1	4	8	98	10	15
4341	1950	4200	TOPSOIL	1	33	20	1035	1	49	15	<1	3	18	2	3	8	109	10	22
4342	2000	4200	TOPSOIL	3	31	24	1224	<1	56	17	1	<1	23	5	<1	8	113	12	19
4343	2050	4200	TOPSOIL	2	33	33	1026	2	57	17	<1	1	25	1	<1	12	124	11	27
4344	2100	4200	TOPSOIL	1	35	32	832	<1	63	17	2	2	26	1	9	14	142	13	35
4345	2150	4200	TOPSOIL	4	27	24	990	2	44	12	2	3	17	<1	4	13	101	12	20
4346	2200	4200	TOPSOIL	1	42	29	789	1	67	18	1	2	33	3	8	16	173	13	47
4347	2250	4200	TOPSOIL	2	41	41	779	1	71	20	2	5	36	<1	3	13	180	13	44
4348	2300	4200	TOPSOIL	2	33	26	976	2	68	18	1	<1	26	2	3	15	166	13	37
4349	2350	4200	TOPSOIL	3	45	35	829	3	81	23	1	<1	24	3	4	17	202	14	50
4350	2400	4200	TOPSOIL	<1	44	40	925	2	80	21	1	<1	17	<1	6	17	194	16	43
4351	2450	4200	TOPSOIL	2	31	50	3649	<1	51	24	1	<1	12	3	2	3	219	5	16
4352	2500	4200	TOPSOIL	<1	17	17	2863	<1	89	15	<1	1	4	2	<1	3	214	5	13
4366	2200	4875	TOPSOIL	1	39	31	873	1	59	18	1	<1	27	3	<1	13	136	13	39
4367	2250	4875	TOPSOIL	<1	38	28	1177	2	72	21	<1	<1	29	<1	<1	13	139	11	38
4368	2300	4875	TOPSOIL	<1	40	24	1527	<1	57	21	<1	1	27	<1	<1	10	109	12	20
4369	2350	4875	TOPSOIL	2	44	32	1253	<1	66	18	1	1	<1	2	<1	15	149	14	29
4370	2400	4875	TOPSOIL	<1	43	38	1407	<1	65	21	<1	<1	<1	<1	<1	14	156	14	33
4371	2450	4875	TOPSOIL	1	47	28	1731	<1	62	21	<1	4	<1	1	<1	14	150	15	21
4372	2500	4875	TOPSOIL	<1	45	28	1408	1	63	21	1	2	28	1	5	16	181	16	41
4373	2550	4875	TOPSOIL	<1	45	27	3926	<1	75	24	3	<1	30	<1	<1	10	215	18	23
4374	2600	4875	TOPSOIL	<1	29	39	5396	1	56	19	1	<1	23	<1	4	9	221	13	16
4375	2650	4875	TOPSOIL	2	33	53	5788	<1	84	19	1	3	27	<1	3	<1	329	8	16
4376	2700	4875	TOPSOIL	5	37	37	3159	<1	67	19	<1	7	21	<1	4	9	237	11	21
4377	2750	4875	TOPSOIL	2	35	31	2005	1	75	15	<1	<1	27	3	2	11	262	9	26
4378	2800	4875	TOPSOIL	4	40	42	2017	<1	65	15	<1	<1	22	<1	5	16	368	10	25

Drill, lag and topsoil chemical data (continued)

No.	E	N	DEPTH	Sb xrf(tr) ppm	Sc xrf(tr) ppm	Se xrf(tr) ppm	Sr xrf(tr) ppm	V xrf(tr) ppm	W xrf(tr) ppm	Y xrf(tr) ppm	Zn xrf(tr) ppm	Zr xrf(tr) ppm
1A	2750	4490	0.5	<1	25	<1	109	231	<1	13	48	89
5A	2710	4490	0.5	2	27	2	216	245	<1	10	35	71
9A	2670	4490	0.5	1	27	1	153	240	<1	11	39	67
17A	2590	4490	0.5	4	45	3	235	451	<1	6	34	58
19A	2570	4490	0.5	4	42	1	204	442	2	6	23	68
21A	2550	4490	0.5	2	37	2	273	289	2	5	15	56
23A	2530	4490	0.5	8	60	1	244	479	<1	8	16	46
30A	2460	4490	0.5	3	30	<1	71	309	3	16	55	104
32A	2440	4490	0.5	4	30	1	97	278	<1	16	66	98
35A	2410	4490	0.5	<1	34	<1	72	439	10	18	69	114
39A	2370	4490	0.5	<1	33	4	91	521	<1	15	42	97
41A	2350	4490	0.5	2	30	2	99	335	2	16	59	99
51A	2250	4490	0.5	6	36	4	43	723	2	20	49	101
53A	2230	4490	0.5	<1	35	<1	73	582	1	17	62	106
55A	2210	4490	0.5	2	33	2	61	652	1	13	51	101
57A	1900	4200	0.5	<1	22	<1	31	461	2	12	33	82
59A	1920	4200	0.5	5	24	1	24	537	3	16	44	87
62A	1950	4200	0.5	<1	29	1	41	485	<1	16	45	116
76A	2090	4200	0.5	<1	24	2	69	257	<1	15	56	105
78A	2110	4200	0.5	1	27	<1	83	214	<1	19	68	132
80A	2130	4200	0.5	4	29	1	63	343	1	16	70	124
82A	2150	4200	0.5	<1	27	<1	79	292	4	17	61	111
83A	2160	4200	0.5	1	28	2	80	388	<1	15	54	107
86A	2190	4200	0.5	<1	26	1	85	294	<1	14	59	99
100A	2330	4200	0.5	3	26	1	48	361	3	16	78	103
102A	2350	4200	0.5	3	28	<1	33	450	<1	18	72	99
104A	2370	4200	0.5	3	32	<1	30	519	3	19	92	104
106A	2390	4200	0.5	6	33	2	38	392	<1	16	69	105
113A	2460	4200	0.5	3	40	2	196	603	1	7	67	71
114A	2470	4200	0.5	1	51	<1	124	599	<1	7	9	65
116A	2490	4200	0.5	<1	44	2	423	245	<1	6	29	42
117A	2500	4200	0.5	2	66	<1	84	692	<1	2	23	57
120A	2200	4705	0.5	1	31	1	73	466	<1	18	80	98
122A	2220	4705	0.5	1	27	<1	120	260	<1	17	74	99
124A	2240	4705	0.5	4	29	3	85	386	3	14	63	93
125A	2250	4705	0.5	<1	30	1	88	375	2	17	73	105
142A	2420	4705	0.5	<1	32	4	45	331	<1	5	41	117
144A	2440	4705	0.5	3	31	1	69	346	<1	18	61	121
146A	2460	4705	0.5	4	30	<1	72	320	<1	16	57	99
148A	2480	4705	0.5	<1	31	2	183	267	<1	15	37	79
150A	2500	4705	0.5	<1	36	5	132	406	1	13	40	91
159A	2590	4705	0.5	3	65	4	230	431	<1	5	14	68
161A	2610	4705	0.5	3	50	4	268	384	<1	5	14	55
162A	2620	4705	0.5	2	57	3	294	461	<1	3	13	50
163A	2630	4705	0.5	2	53	1	302	347	<1	7	14	51
164A	2640	4705	0.5	<1	55	2	168	482	<1	8	17	64
166A	2660	4705	0.5	1	40	2	196	444	2	3	21	45
168A	2680	4705	0.5	<1	33	2	105	392	<1	11	29	68
170A	2700	4705	0.5	<1	47	2	142	501	<1	4	23	50
180A	2200	4875	0.5	1	27	2	79	320	1	15	67	108
183A	2230	4875	0.5	6	30	2	95	384	2	15	57	114
186A	2260	4875	0.5	3	34	1	84	587	4	13	60	105
204A	2440	4875	0.5	3	32	<1	124	304	<1	14	41	99
206A	2460	4875	0.5	1	32	1	171	261	<1	15	41	112
208A	2480	4875	0.5	2	29	3	152	258	<1	13	46	106
210A	2500	4875	0.5	1	31	1	122	284	2	15	47	108
212A	2520	4875	0.5	<1	32	1	159	343	<1	13	50	112
220A	2600	4875	0.5	5	38	2	82	594	6	7	14	75
221A	2610	4875	0.5	2	35	3	122	447	<1	6	14	65
222A	2620	4875	0.5	4	37	3	131	484	<1	4	12	61
223A	2630	4875	0.5	5	37	1	171	523	<1	7	13	71
224A	2640	4875	0.5	4	44	<1	208	518	<1	4	12	61
225A	2650	4875	0.5	2	38	6	265	583	<1	2	10	56
226A	2660	4875	0.5	1	34	2	343	540	<1	7	12	58
237A	2770	4875	0.5	1	27	3	188	266	<1	8	26	55
238A	2780	4875	0.5	<1	39	5	117	341	3	21	42	62
239A	2790	4875	0.5	2	41	3	104	344	<1	21	49	69
240A	2800	4875	0.5	1	34	1	213	238	<1	13	35	64
1B	2750	4490	1.5	1	26	3	75	251	<1	13	48	91
5B	2710	4490	1.5	<1	23	5	57	445	<1	13	25	56
9B	2670	4490	1.5	<1	29	2	63	313	<1	18	27	63
17B	2590	4490	1.5	6	59	3	120	587	<1	11	7	60
19B	2570	4490	1.5	5	51	4	121	732	1	13	7	62
21B	2550	4490	1.5	3	63	3	127	478	6	4	15	49
23B	2530	4490	1.5	7	68	4	107	780	1	6	27	56
32B	2440	4490	1.5	6	44	1	65	620	<1	11	32	73
35B	2410	4490	1.5	3	37	5	76	688	<1	16	37	124
39B	2370	4490	1.5	<1	30	4	124	297	<1	28	28	81
41B	2350	4490	1.5	5	35	<1	51	672	<1	22	41	95
51B	2250	4490	1.5	<1	35	3	57	634	5	22	35	105
53B	2230	4490	1.5	2	37	2	45	800	1	28	36	100
55B	2210	4490	1.5	3	33	2	37	654	4	8	39	106
57B	1900	4200	1.5	<1	41	2	42	1012	3	6	37	108
59B	1920	4200	1.5	5	37	1	38	889	5	10	32	92
62B	1950	4200	1.5	3	39	<1	52	833	311	15	39	111

Drill, lag and topsoil chemical data (continued)

No.	E	N	DEPTH	Sb xrf(tr) ppm	Sc xrf(tr) ppm	Se xrf(tr) ppm	Sr xrf(tr) ppm	V xrf(tr) ppm	W xrf(tr) ppm	Y xrf(tr) ppm	Zn xrf(tr) ppm	Zr xrf(tr) ppm
76B	2090	4200	1.5	<1	27	<1	41	377	<1	9	40	123
78B	2110	4200	1.5	1	33	<1	47	562	3	20	47	113
80B	2130	4200	1.5	1	29	6	32	546	<1	4	31	110
82B	2150	4200	1.5	1	34	4	49	656	20	14	38	111
86B	2190	4200	1.5	2	30	2	52	680	9	16	35	85
100B	2330	4200	1.5	3	39	3	29	683	3	10	33	82
102B	2350	4200	1.5	1	39	1	56	721	5	14	31	82
104B	2370	4200	1.5	2	39	4	51	838	6	13	34	87
106B	2390	4200	1.5	5	33	4	89	754	4	11	22	73
114B	2470	4200	1.5	1	49	4	142	539	1	5	17	64
116B	2490	4200	1.5	<1	49	4	141	492	<1	3	18	47
120B	2200	4705	1.5	5	29	6	98	560	<1	9	37	106
124B	2240	4705	1.5	6	32	3	65	720	2	6	45	92
142B	2420	4705	1.5	2	31	1	110	297	<1	19	54	104
146B	2460	4705	1.5	4	28	1	80	300	<1	17	50	100
150B	2500	4705	1.5	5	46	6	66	893	<1	9	25	93
162B	2620	4705	1.5	<1	54	4	61	389	1	4	5	41
164B	2640	4705	1.5	4	47	1	62	504	<1	8	14	71
166B	2660	4705	1.5	5	54	6	58	583	2	5	25	48
168B	2680	4705	1.5	<1	39	3	16	313	<1	2	15	47
170B	2700	4705	1.5	3	41	5	29	413	<1	7	15	54
180B	2200	4875	1.5	3	32	3	41	576	1	6	35	115
186B	2260	4875	1.5	4	30	3	39	491	<1	4	33	122
204B	2440	4875	1.5	6	35	6	102	574	<1	10	32	101
208B	2480	4875	1.5	<1	29	2	90	265	<1	15	41	132
212B	2520	4875	1.5	3	31	3	137	276	<1	14	41	123
220B	2600	4875	1.5	4	35	2	92	656	5	3	10	61
224B	2640	4875	1.5	2	40	3	116	675	<1	4	8	64
238B	2780	4875	1.5	3	46	9	17	394	<1	4	57	73
240B	2800	4875	1.5	<1	34	4	56	273	<1	13	41	67
1C	2750	4490	2.5	<1	28	2	40	241	<1	7	45	62
5C	2710	4490	2.5	<1	21	7	18	355	<1	2	16	44
9C	2670	4490	2.5	2	33	7	31	384	<1	3	23	58
17C	2590	4490	2.5	2	50	7	58	644	<1	8	9	67
23C	2530	4490	2.5	6	62	4	38	777	1	6	10	58
32C	2440	4490	2.5	14	46	4	33	830	10	4	18	68
35C	2410	4490	2.5	15	41	6	30	726	3	6	15	111
39C	2370	4490	2.5	2	36	2	33	435	<1	5	28	128
51C	2250	4490	2.5	<1	35	5	43	293	<1	8	33	164
55C	2210	4490	2.5	2	29	6	42	418	1	6	30	148
57C	1900	4200	2.5	6	36	<1	34	615	2	6	28	103
59C	1920	4200	2.5	5	46	3	30	1102	4	7	30	116
62C	1950	4200	2.5	5	32	5	23	510	14	5	28	127
80C	2130	4200	2.5	7	32	5	21	393	4	7	32	159
82C	2150	4200	2.5	2	32	5	34	402	6	8	29	129
100C	2330	4200	2.5	10	38	2	46	677	<1	3	15	61
102C	2350	4200	2.5	11	37	2	62	715	6	8	22	42
104C	2370	4200	2.5	7	37	6	117	663	4	3	17	48
106C	2390	4200	2.5	7	36	3	42	996	<1	5	15	60
114c	2470	4200	2.5	5	69	3	51	575	8	7	19	60
116C	2490	4200	2.5	6	46	2	40	520	<1	4	18	39
120C	2200	4705	2.5	1	31	6	43	412	<1	5	32	138
124C	2240	4705	2.5	6	30	8	32	536	<1	5	36	123
142C	2420	4705	2.5	<1	31	5	38	415	2	5	32	136
146C	2460	4705	2.5	<1	30	3	43	282	<1	13	44	127
150C	2500	4705	2.5	1	31	5	43	652	<1	4	17	90
164C	2640	4705	2.5	2	42	9	38	428	<1	4	15	77
168C	2680	4705	2.5	3	33	6	7	377	<1	2	13	51
170C	2700	4705	2.5	2	48	7	18	404	<1	2	24	53
180C	2200	4875	2.5	3	28	4	34	314	<1	6	30	144
186C	2260	4875	2.5	4	32	6	20	406	7	6	30	132
208C	2480	4875	2.5	3	32	7	53	356	<1	13	38	137
220C	2600	4875	2.5	2	29	4	76	613	<1	4	13	83
224C	2640	4875	2.5	1	32	5	60	633	2	5	11	72
238C	2780	4875	2.5	3	41	9	11	340	2	1	38	71
240C	2800	4875	2.5	3	29	5	22	320	<1	3	30	64
1D	2750	4490	3.5	<1	30	2	17	227	<1	2	55	32
17D	2590	4490	3.5	2	37	8	22	525	1	1	9	73
23D	2530	4490	3.5	6	41	5	19	633	<1	4	12	62
32D	2440	4490	3.5	6	33	6	12	635	5	3	18	61
39D	2370	4490	3.5	1	37	1	33	274	1	7	26	181
55D	2210	4490	3.5	3	29	4	30	313	<1	7	28	166
59D	1920	4200	3.5	1	35	3	21	505	3	5	28	155
104D	2370	4200	3.5	1	33	6	34	640	5	4	15	58
164D	2640	4705	3.5	9	37	9	9	560	2	2	15	64
208D	2480	4875	3.5	2	27	6	41	409	<1	5	27	148
220D	2600	4875	3.5	4	26	3	37	719	<1	5	14	80
224D	2640	4875	3.5	<1	30	6	28	567	<1	3	12	78
240D	2800	4875	3.5	4	36	4	20	311	<1	4	26	70
1E	2750	4490	4.5	<1	31	<1	12	366	<1	3	64	33
39E	2370	4490	4.5	6	37	3	15	365	<1	3	15	186
59E	1920	4200	4.5	4	29	4	17	352	2	6	25	207
104E	2370	4200	4.5	2	26	4	3	664	6	1	10	56
240E	2800	4875	4.5	2	31	8	12	387	<1	3	29	68

Drill, lag and topsoil chemical data (continued)

No.	E	N	DEPTH	Sb xrf(tr) ppm	Sc xrf(tr) ppm	Se xrf(tr) ppm	Sr xrf(tr) ppm	V xrf(tr) ppm	W xrf(tr) ppm	Y xrf(tr) ppm	Zn xrf(tr) ppm	Zr xrf(tr) ppm
4200	2700	4705	LAG	4	66	4	62	1111	3	11	38	68
4201	2650	4705	LAG	6	64	<1	55	1169	6	11	32	70
4202	2600	4705	LAG	5	66	1	24	1453	8	10	26	81
4203	2550	4705	LAG	8	69	2	7	1528	14	10	29	87
4204	2500	4705	LAG	5	56	<1	15	1397	12	12	31	99
4205	2450	4705	LAG	5	52	5	7	1356	10	14	30	99
4206	2400	4705	LAG	2	41	2	11	1209	7	13	30	95
4207	2350	4705	LAG	2	49	1	7	1256	12	14	38	102
4208	2300	4705	LAG	6	48	<1	11	1306	5	14	29	100
4209	2250	4705	LAG	2	34	<1	11	829	8	11	31	81
4210	2200	4705	LAG	20	45	5	11	1090	9	16	35	93
4270	2700	4705	TOPSOIL	4	31	1	89	306	<1	14	58	102
4271	2650	4705	TOPSOIL	4	35	<1	71	436	<1	11	46	94
4272	2600	4705	TOPSOIL	<1	40	2	54	633	7	11	44	113
4273	2550	4705	TOPSOIL	1	36	1	26	530	<1	11	45	128
4274	2500	4705	TOPSOIL	4	31	1	31	486	<1	15	47	129
4275	2450	4705	TOPSOIL	5	20	2	26	352	<1	12	45	106
4276	2400	4705	TOPSOIL	2	29	2	30	502	<1	15	49	140
4277	2350	4705	TOPSOIL	1	28	<1	50	271	2	16	76	132
4278	2300	4705	TOPSOIL	3	30	<1	46	321	1	19	72	133
4279	2250	4705	TOPSOIL	<1	17	2	25	278	<1	12	43	103
4280	2200	4705	TOPSOIL	1	27	<1	46	263	<1	22	87	164
4292	2750	4490	TOPSOIL	2	24	<1	67	272	<1	15	67	97
4293	2700	4490	TOPSOIL	1	25	<1	84	268	<1	14	59	93
4294	2650	4490	TOPSOIL	1	27	2	51	243	<1	14	68	99
4295	2600	4490	TOPSOIL	1	33	<1	97	408	1	10	40	98
4296	2550	4490	TOPSOIL	3	37	<1	84	565	<1	9	33	93
4297	2500	4490	TOPSOIL	5	28	2	21	512	4	9	33	113
4298	2450	4490	TOPSOIL	1	27	3	21	498	<1	14	41	124
4299	2400	4490	TOPSOIL	2	28	2	27	538	7	15	52	130
4300	2350	4490	TOPSOIL	2	25	<1	44	258	2	19	73	152
4301	2300	4490	TOPSOIL	<1	21	<1	37	309	<1	17	55	123
4302	2250	4490	TOPSOIL	4	26	<1	35	343	<1	14	72	118
4303	2200	4490	TOPSOIL	<1	26	<1	40	334	<1	18	91	125
4340	1900	4200	TOPSOIL	2	16	1	20	348	<1	9	36	102
4341	1950	4200	TOPSOIL	1	19	<1	24	325	<1	11	44	118
4342	2000	4200	TOPSOIL	<1	21	4	21	398	<1	11	40	107
4343	2050	4200	TOPSOIL	4	21	1	29	336	2	13	51	127
4344	2100	4200	TOPSOIL	<1	23	2	37	270	<1	16	60	144
4345	2150	4200	TOPSOIL	5	18	<1	27	313	<1	11	47	130
4346	2200	4200	TOPSOIL	2	26	1	52	242	<1	20	77	181
4347	2250	4200	TOPSOIL	1	26	1	51	259	<1	18	83	140
4348	2300	4200	TOPSOIL	2	25	<1	39	294	1	15	70	127
4349	2350	4200	TOPSOIL	1	30	<1	47	268	<1	19	93	136
4350	2400	4200	TOPSOIL	3	30	<1	39	279	<1	20	92	131
4351	2450	4200	TOPSOIL	1	30	<1	25	582	<1	11	38	104
4352	2500	4200	TOPSOIL	<1	38	3	95	393	<1	7	29	88
4366	2200	4875	TOPSOIL	1	23	<1	44	279	<1	16	62	142
4367	2250	4875	TOPSOIL	2	26	<1	43	372	<1	14	59	144
4368	2300	4875	TOPSOIL	2	25	1	24	529	3	12	45	131
4369	2350	4875	TOPSOIL	4	27	<1	28	411	<1	16	57	144
4370	2400	4875	TOPSOIL	4	29	2	28	462	2	15	52	135
4371	2450	4875	TOPSOIL	5	30	3	27	589	1	15	48	120
4372	2500	4875	TOPSOIL	<1	29	<1	40	381	<1	14	60	123
4373	2550	4875	TOPSOIL	2	43	<1	53	708	<1	14	42	118
4374	2600	4875	TOPSOIL	1	38	3	19	681	<1	11	28	131
4375	2650	4875	TOPSOIL	1	39	1	109	591	5	9	28	90
4376	2700	4875	TOPSOIL	3	33	1	112	432	<1	10	39	99
4377	2750	4875	TOPSOIL	3	32	1	127	297	<1	13	56	95
4378	2800	4875	TOPSOIL	3	32	2	100	315	<1	14	65	96

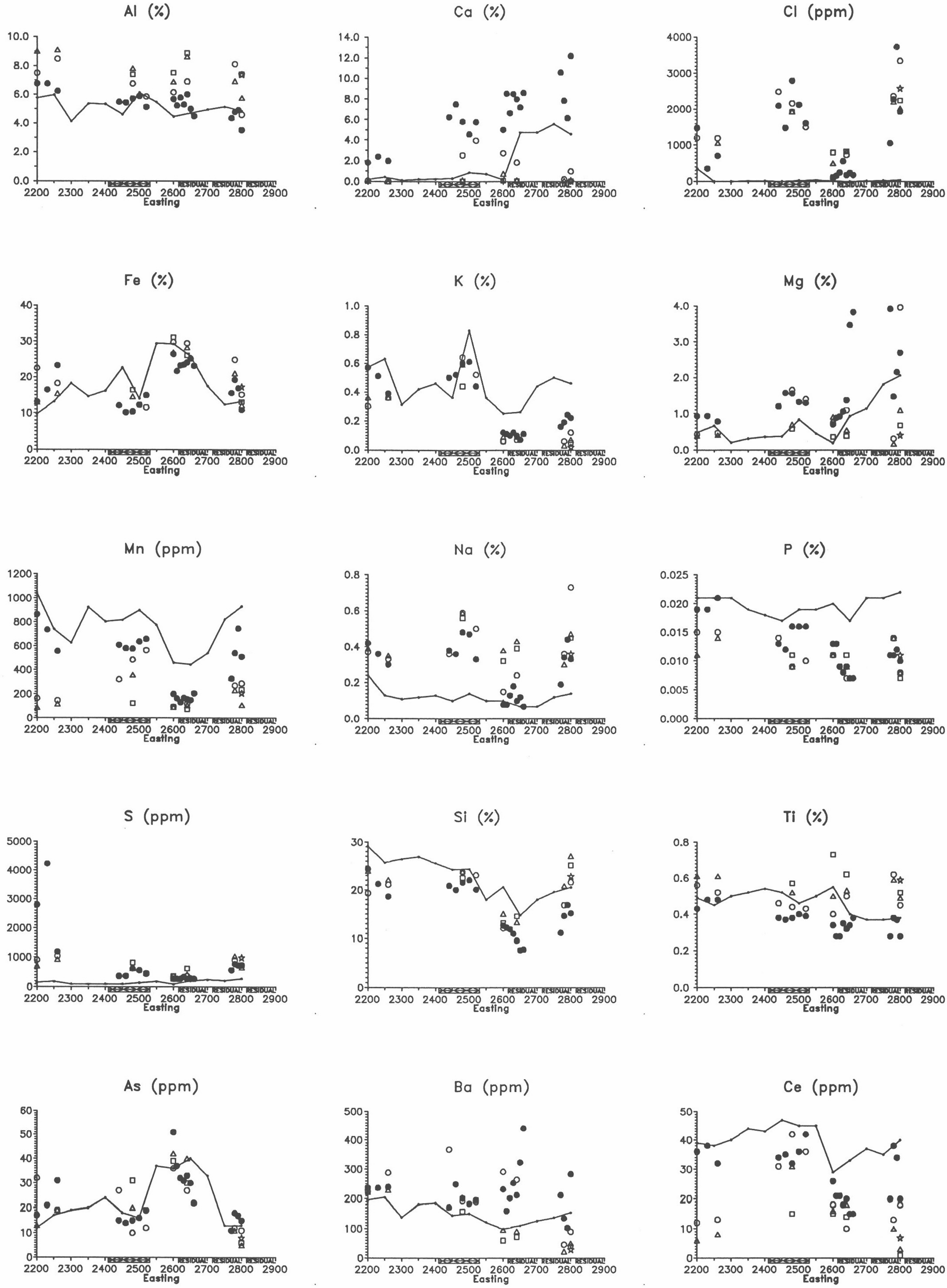
Drill chemical data for gold

No.	E	N	0.5	1.5	2.5	3.5	4.5
57	1900	4200	1	1	1	1	-
58	1910	4200	10	-	-	-	-
59	1920	4200	4	4	1	1	1
60	1930	4200	1	-	-	-	-
62	1950	4200	14	8	1	1	1
63	1960	4200	4	-	-	-	-
64	1970	4200	8	4	1	1	1
65	1980	4200	6	-	-	-	-
66	1990	4200	4	1	1	6	-
67	2000	4200	8	-	-	-	-
68	2010	4200	4	1	1	1	1
69	2020	4200	12	-	-	-	-
70	2030	4200	4	2	1	1	-
71	2040	4200	10	-	-	-	-
72	2050	4200	4	2	1	1	1
73	2060	4200	4	-	-	-	-
74	2070	4200	6	4	2	2	-
75	2080	4200	8	-	-	-	-
76	2090	4200	12	4	2	1	1
77	2100	4200	18	-	-	-	-
78	2110	4200	12	12	1	1	-
79	2120	4200	14	-	-	-	-
80	2130	4200	26	2	1	1	1
81	2140	4200	32	1	1	-	-
82	2150	4200	36	28	10	2	-
83	2160	4200	22	10	1	-	-
84	2170	4200	10	4	1	1	1
85	2180	4200	16	1	-	-	-
86	2190	4200	14	12	1	1	-
87	2200	4200	6	-	-	-	-
88	2210	4200	22	8	1	1	1
89	2220	4200	14	-	-	-	-
90	2230	4200	18	6	1	1	-
91	2240	4200	24	-	-	-	-
92	2250	4200	20	6	6	1	1
94	2270	4200	28	8	4	1	
95	2280	4200	18	-	-	-	-
96	2290	4200	10	4	4	4	4
97	2300	4200	16	-	-	-	-
99	2320	4200	20	-	-	-	-
100	2330	4200	18	8	4	8	6
101	2340	4200	18	6	8	8	4
102	2350	4200	24	28	8	14	
103	2360	4200	28	12	12	14	16
104	2370	4200	32	30	22	90	16
105	2380	4200	26	-	-	-	-
106	2390	4200	26	14	8	8	
107	2400	4200	16	-	-	-	-
108	2410	4200	20	6	6	8	6
109	2420	4200	20	-	-	-	-
110	2430	4200	12	6	2	8	-
111	2440	4200	10	-	-	-	-
112	2450	4200	22	6	4	1	-
113	2460	4200	86	-	-	-	-
114	2470	4200	86	112	16	4	-
115	2480	4200	48	-	-	-	-
116	2490	4200	44	18	4	2	6
117	2500	4200	30	-	-	-	-
56	2200	4490	8	-	-	-	-
55	2210	4490	6	1	1	1	1
54	2220	4490	6	-	-	-	-
53	2230	4490	10	4	1	1	-
52	2240	4490	10	-	-	-	-
51	2250	4490	6	2	1	1	1
50	2260	4490	12	-	-	-	-
49	2270	4490	12	1	1	1	-
48	2280	4490	14	-	-	-	-
47	2290	4490	12	1	1	1	1
46	2300	4490	12	-	-	-	-
45	2310	4490	10	1	1	1	-
44	2320	4490	10	-	-	-	-
43	2330	4490	26	6	1	1	1
42	2340	4490	24	2	-	-	-
41	2350	4490	26	20	1	1	-
40	2360	4490	30	14	1	4	-
39	2370	4490	32	20	6	32	1
38	2380	4490	20	8	4	1	-
37	2390	4490	24	8	1	1	2
36	2400	4490	18	14	12	4	-
35	2410	4490	42	30	16	6	-
34	2420	4490	34	8	16	6	8
33	2430	4490	22	-	-	-	-
32	2440	4490	26	20	12	6	-

No.	E	N	0.5	1.5	2.5	3.5	4.5
31	2450	4490	32	-	-	-	-
30	2460	4490	28	14	8	1	4
29	2470	4490	30	16	4	1	-
28	2480	4490	26	-	-	-	-
27	2490	4490	28	20	6	2	-
26	2500	4490	26	-	-	-	-
25	2510	4490	82	16	6	4	-
24	2520	4490	160	-	-	-	-
23	2530	4490	286	84	28	1	8
22	2540	4490	292	-	-	-	-
21	2550	4490	164	58	36	8	-
20	2560	4490	178	-	-	-	-
19	2570	4490	164	106	42	12	4
18	2580	4490	226	-	-	-	-
17	2590	4490	382	158	34	12	-
16	2600	4490	324	-	-	-	-
15	2610	4490	220	92	26	34	10
14	2620	4490	240	-	-	-	-
13	2630	4490	112	82	4	4	-
12	2640	4490	54	-	-	-	-
11	2650	4490	60	88	12	4	-
10	2660	4490	68	-	-	-	-
9	2670	4490	76	60	2	2	2
8	2680	4490	118	-	-	-	-
7	2690	4490	114	56	1	1	-
6	2700	4490	68	-	-	-	-
5	2710	4490	116	60	4	1	1
4	2720	4490	76	-	-	-	-
3	2730	4490	106	48	8	4	-
2	2740	4490	126	-	-	-	-
1	2750	4490	72	80	22	24	8
120	2200	4705	10	4	1	1	1
121	2210	4705	4	-	-	-	-
122	2220	4705	14	4	1	-	-
123	2230	4705	10	-	-	-	-
124	2240	4705	8	4	1	1	-
125	2250	4705	10	-	-	-	-
126	2260	4705	10	4	1	-	-
127	2270	4705	12	-	-	-	-
128	2280	4705	12	6	1	1	1
129	2290	4705	10	-	-	-	-
130	2300	4705	10	4	1	-	-
131	2310	4705	16	-	-	-	-
132	2320	4705	10	1	1	1	-
133	2330	4705	14	-	-	-	-
134	2340	4705	12	1	1	-	-
135	2350	4705	24	-	-	-	-
136	2360	4705	20	2	1	1	1
137	2370	4705	28	-	-	-	-
138	2380	4705	32	12	1	-	-
139	2390	4705	30	-	-	-	-
140	2400	4705	32	6	1	1	-
141	2410	4705	32	-	-	-	-
142	2420	4705	6	42	1	-	-
143	2430	4705	24	-	-	-	-
144	2440	4705	24	16	6	1	1
145	2450	4705	38	-	-	-	-
146	2460	4705	42	42	14	-	-
147	2470	4705	22	-	-	-	-
148	2480	4705	62	22	1	-	-
149	2490	4705	50	-	-	-	-
150	2500	4705	58	20	1	-	-
151	2510	4705	64	-	-	-	-
152	2520	4705	62	28	2	1	1
153	2530	4705	42	-	-	-	-
154	2540	4705	50	28	8	-	-
155	2550	4705	50	-	-	-	-
156	2560	4705	56	228	4	1	-
157	2570	4705	58	-	-	-	-
158	2580	4705	54	12	1	-	-
159	2590	4705	76	-	-	-	-
160	2600	4705	110	24	6	-	1
161	2610	4705	138	-	-	-	-
162	2620	4705	122	64	14	-	-
163	2630	4705	1672	-	-	-	-
164	2640	4705	234	72	32	28	-
165	2650	4705	148	-	-	-	-
166	2660	4705	132	44	20	-	-
167	2670	4705	80	-	-	-	-
168	2680	4705	68	18	1	-	6
169	2690	4705	170	-	-	-	-
170	2700	4705	128	12	2	1	-

No.	E	N	0.5	1.5	2.5	3.5	4.5
180	2200	4875	10	1	1	1	1
181	2210	4875	8	-	-	-	-
182	2220	4875	14	1	1	-	-
183	2230	4875	18	-	-	-	-
184	2240	4875	12	1	1	1	-
185	2250	4875	12	-	-	-	-
186	2260	4875	12	1	1	-	-
187	2270	4875	14	-	-	-	-
188	2280	4875	14	1	1	1	1
189	2290	4875	10	-	-	-	-
190	2300	4875	10	1	1	-	-
191	2310	4875	8	-	-	-	-
192	2320	4875	10	1	1	1	-
193	2330	4875	10	-	-	-	-
194	2340	4875	8	16	1	-	-
195	2350	4875	36	-	-	-	-
196	2360	4875	26	8	1	1	1
197	2370	4875	30	8	1	1	-
198	2380	4875	30	38	1	-	-
199	2390	4875	46	-	-	-	-
200	2400	4875	28	42	-	-	-
201	2410	4875	1	-	-	-	-
203	2430	4875	24	-	-	-	-
204	2440	4875	28	32	4	2	1
205	2450	4875	30	-	-	-	-
206	2460	4875	42	20	6	-	-
207	2470	4875	32	6	24	1	1
208	2480	4875	42	46	18	1	-
209	2490	4875	40	-	-	-	-
210	2500	4875	36	34	34	-	-
211	2510	4875	36	-	-	-	-
212	2520	4875	50	34	24	4	1
213	2530	4875	48	-	-	-	-
214	2540	4875	60	24	2	-	-
215	2550	4875	44	-	-	-	-
216	2560	4875	38	42	8	1	-
217	2570	4875	38	-	-	-	-
218	2580	4875	32	24	12	-	-
219	2590	4875	102	-	-	-	-
220	2600	4875	78	18	18	6	4
221	2610	4875	84	-	-	-	-
222	2620	4875	80	30	16	-	-
223	2630	4875	90	-	-	-	-
224	2640	4875	64	46	16	6	-
225	2650	4875	42	-	-	-	-
226	2660	4875	36	32	18	-	-
227	2670	4875	42	-	-	-	-
228	2680	4875	78	46	16	6	4
229	2690	4875	72	-	-	-	-
230	2700	4875	102	32	22	-	-
231	2710	4875	150	-	-	-	-
232	2720	4875	126	50	6	2	-
233	2730	4875	74	-	-	-	-
234	2740	4875	142	26	6	-	-
235	2750	4875	76	-	-	-	-
236	2760	4875	72	44	12	1	1
237	2770	4875	92	-	-	-	-
238	2780	4875	114	6	2	-	-
239	2790	4875	86	-	-	-	-
240	2800	4875	74	54	6	1	1

4875N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Ca (%)
Cl (ppm)
Fe (%)
K (%)
Mg (%)
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S (ppm)
Si (%)
Ti (%)
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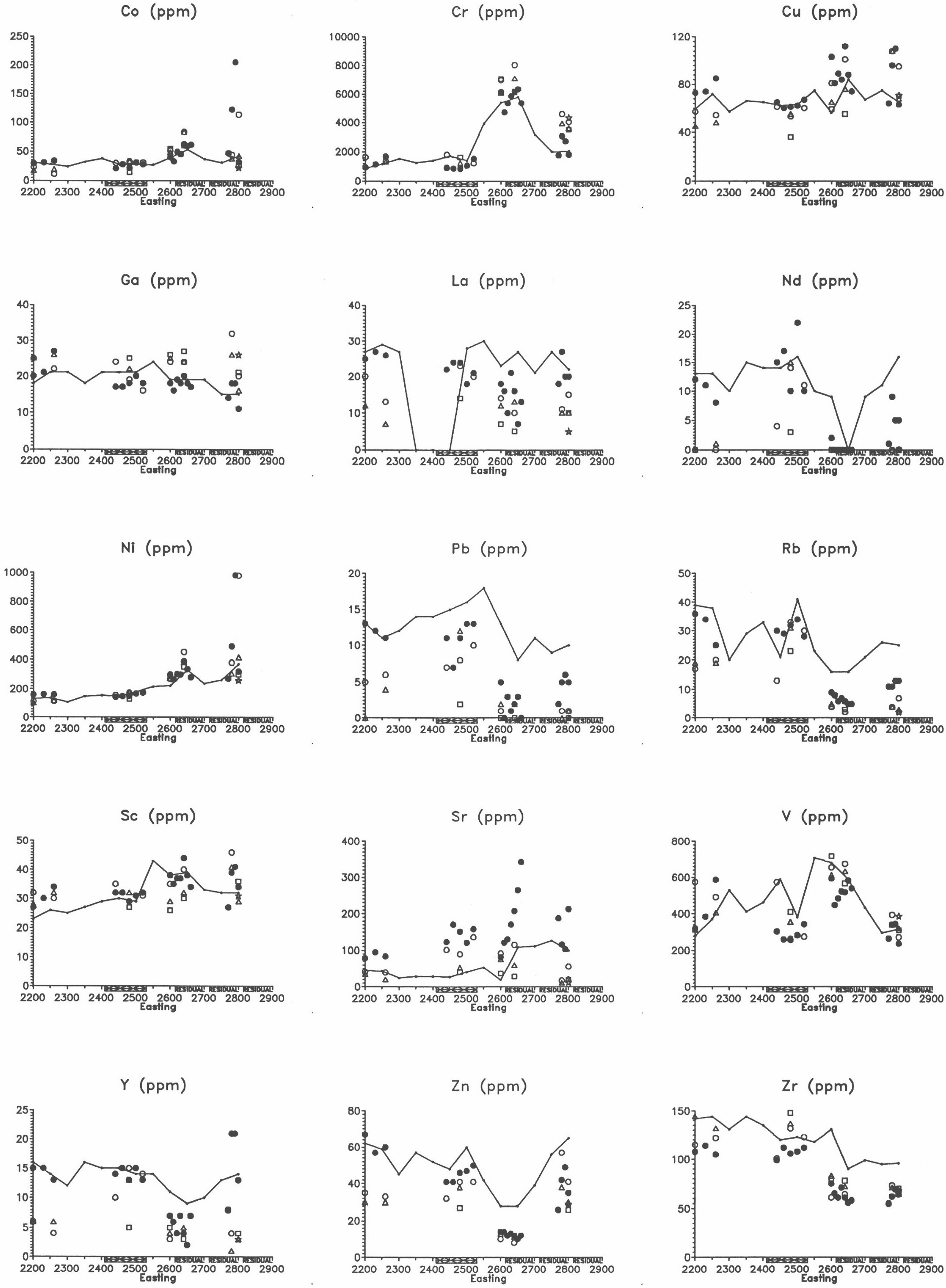
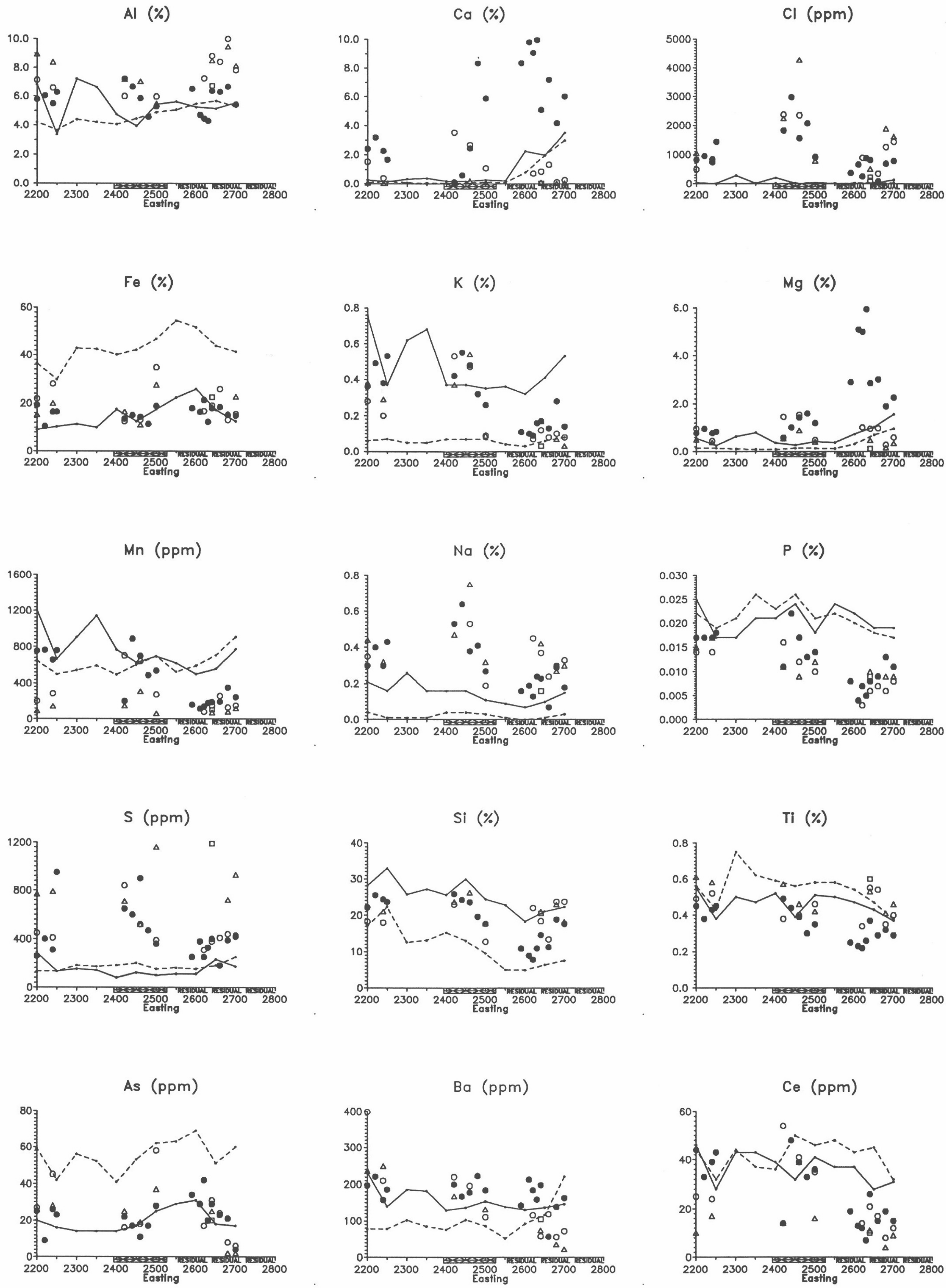
Ba (ppm)
Ce (ppm)
Easting
RESIDUAL

4875N



Co (ppm)
Cr (ppm)
Cu (ppm)
Ga (ppm)
La (ppm)
Nd (ppm)
Ni (ppm)
Pb (ppm)
Rb (ppm)
Sc (ppm)
Sr (ppm)
V (ppm)
Y (ppm)
Zn (ppm)
Zr (ppm)
Easting
RESIDUAL
2200 2300 2400 2500 2600 2700 2800 2900

4705N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Ca (%)
Cl (ppm)
Fe (%)
K (%)
Mg (%)
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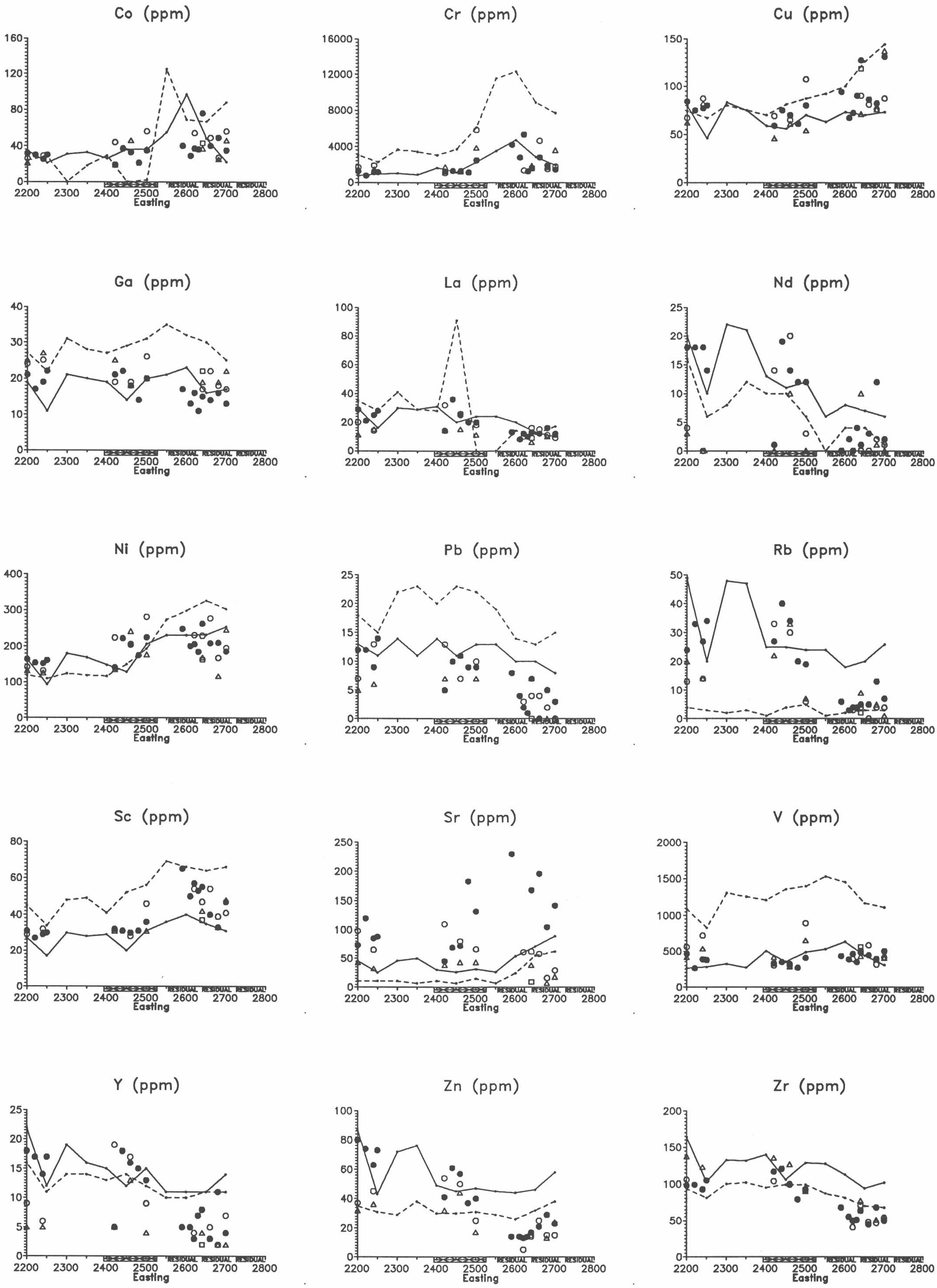
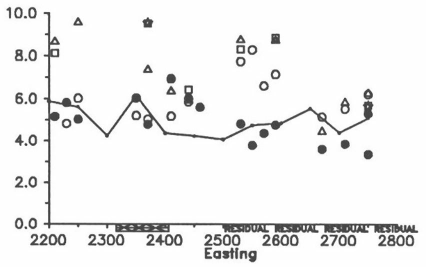
Na (%)
P (%)
S (ppm)
Si (%)
Ti (%)
As (ppm)
Ba (ppm)
Ce (ppm)
2200 2300 2400 2500 2600 2700 2800
Easting
RESIDUAL RESIDUAL RESIDUAL

4705N

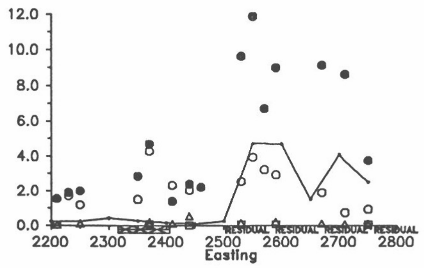

Co (ppm)
Cr (ppm)
Cu (ppm)
Ga (ppm)
La (ppm)
Nd (ppm)
Ni (ppm)
Pb (ppm)
Rb (ppm)
Sc (ppm)
Sr (ppm)
V (ppm)
Y (ppm)
Zn (ppm)
Zr (ppm)
2200 2300 2400 2500 2600 2700 2800
Easting
RESIDUAL RESIDUAL RESIDUAL

4490N

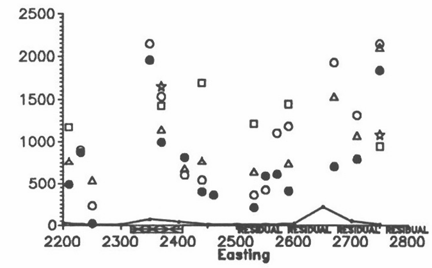
Al (%)



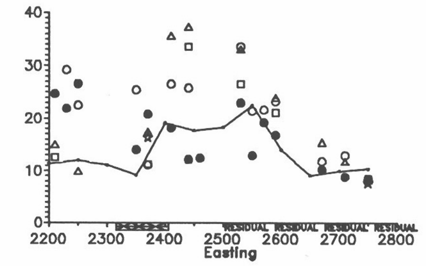
Ca (%)



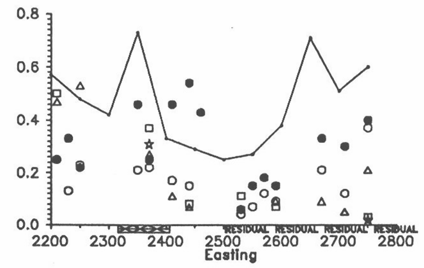
Cl (ppm)



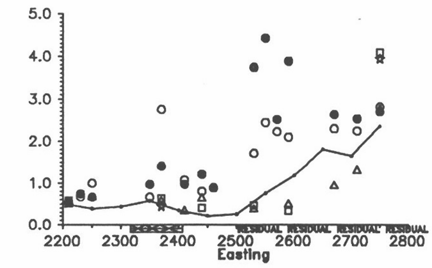
Fe (%)



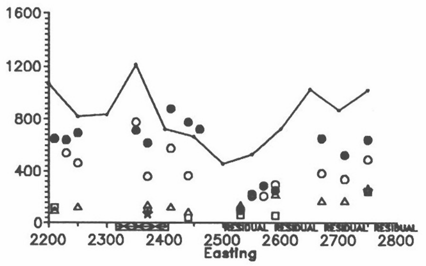
K (%)



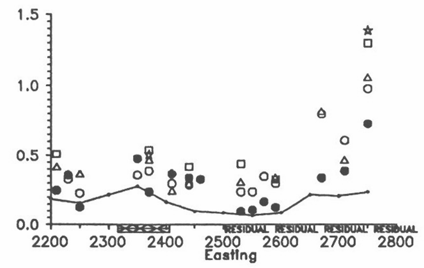
Mg (%)



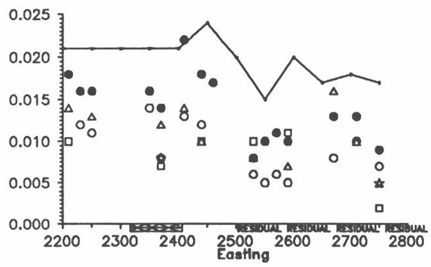
Mn (ppm)



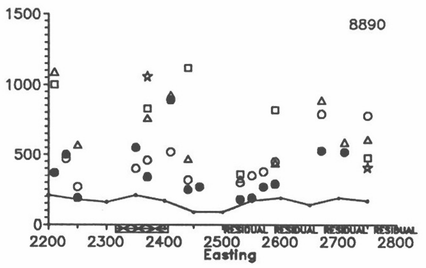
Na (%)



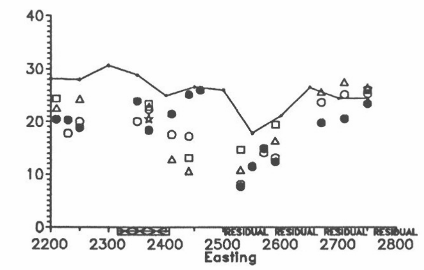
P (%)



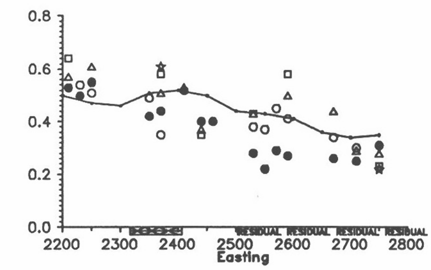
S (ppm)



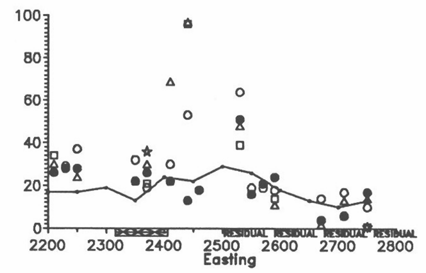
Si (%)



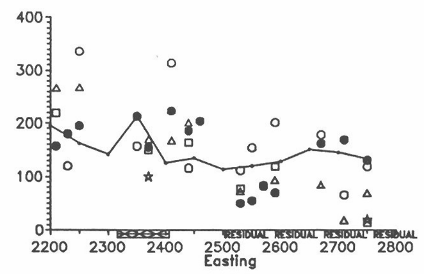
Ti (%)



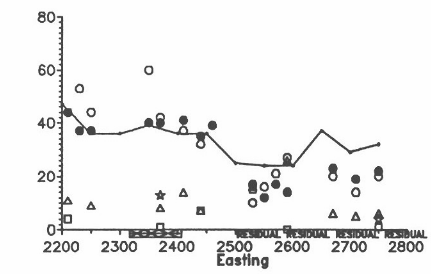
As (ppm)



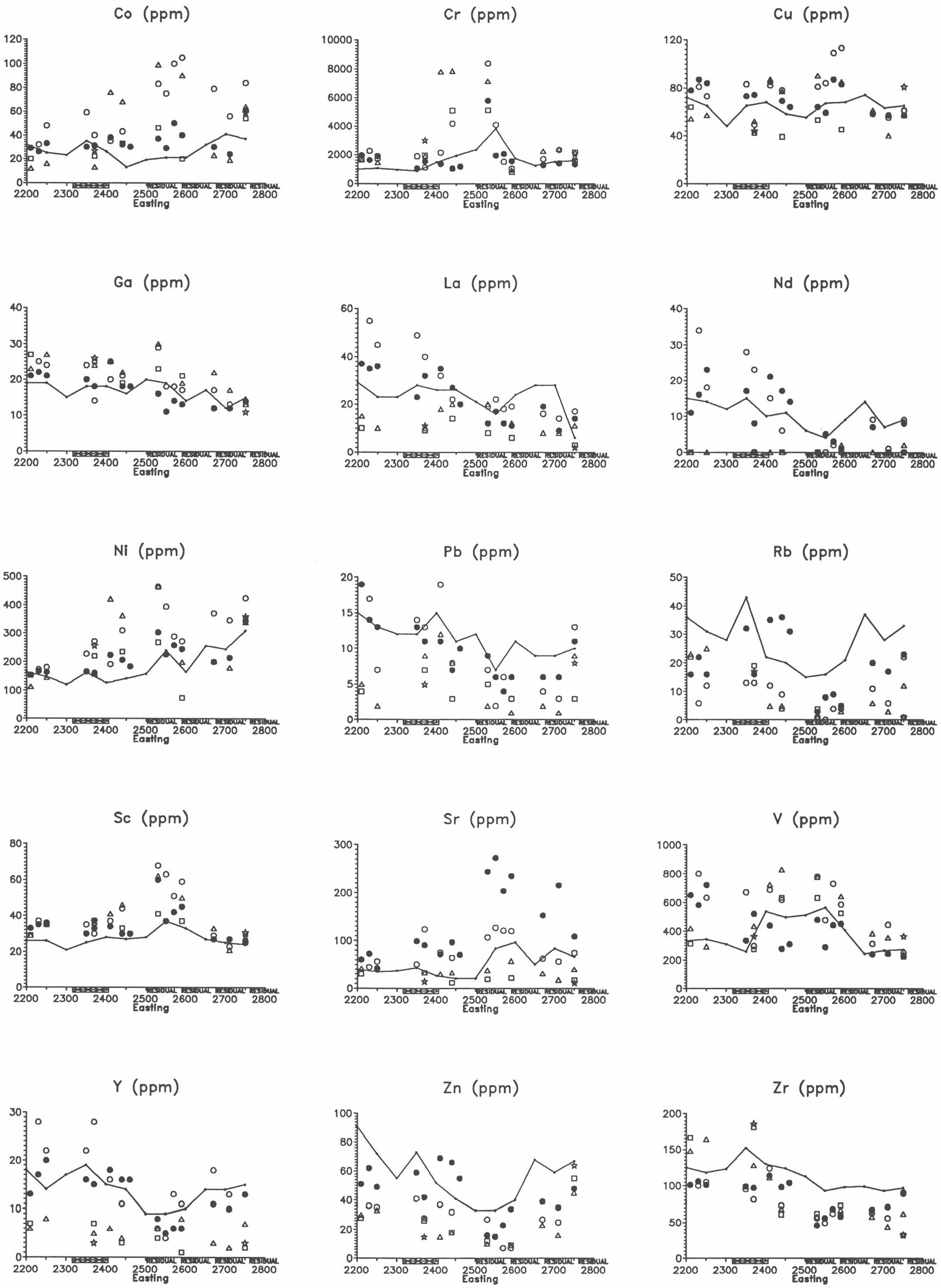
Ba (ppm)



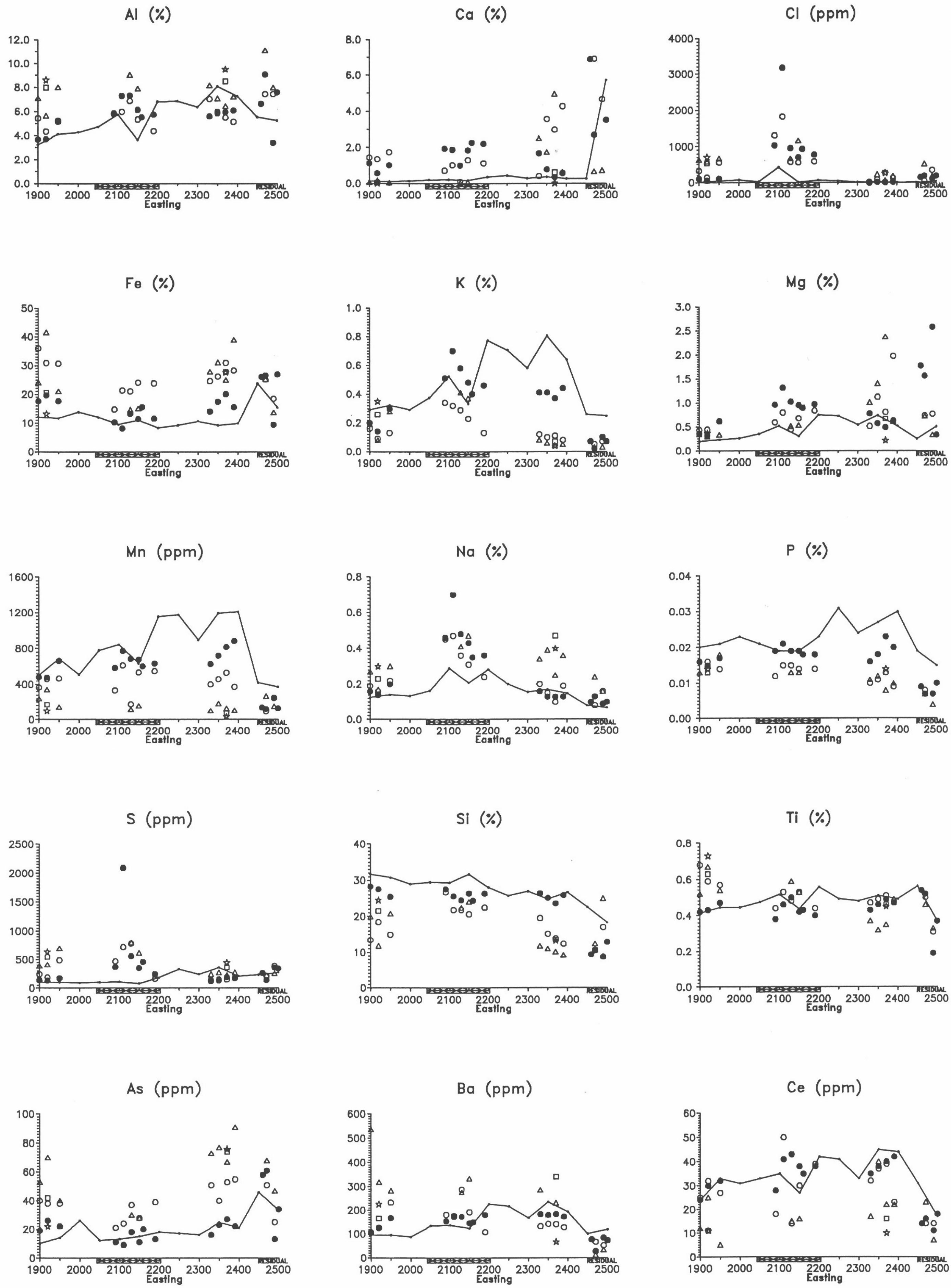
Ce (ppm)



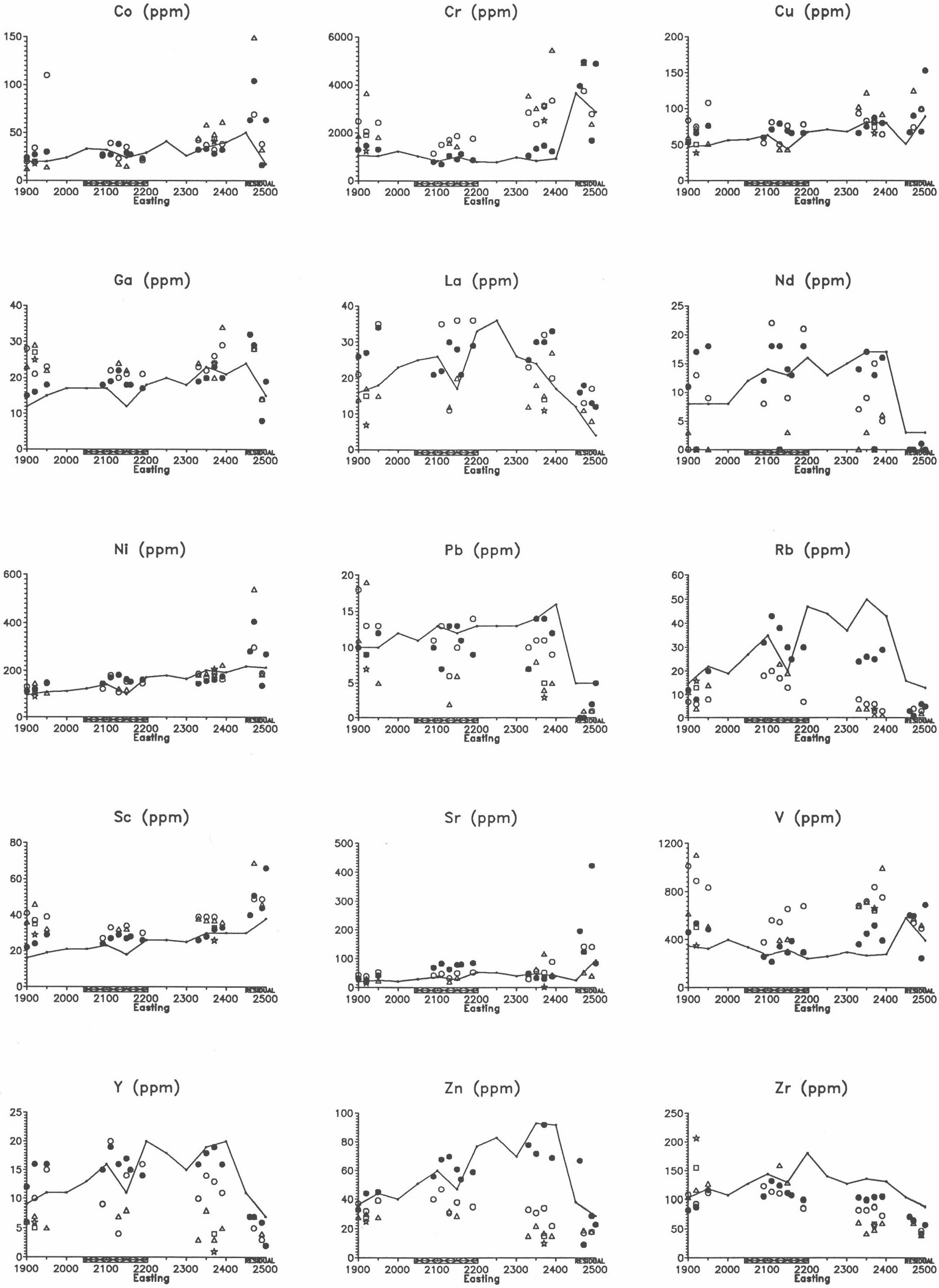
4490N


Co (ppm)
Cr (ppm)
Cu (ppm)
Ga (ppm)
La (ppm)
Nd (ppm)
Ni (ppm)
Pb (ppm)
Rb (ppm)
Sc (ppm)
Sr (ppm)
V (ppm)
Y (ppm)
Zn (ppm)
Zr (ppm)
2200 2300 2400 2500 2600 2700 2800
Easting
RESIDUAL RESIDUAL RESIDUAL RESIDUAL

4200N


Al (%)
Ca (%)
Cl (ppm)
Fe (%)
K (%)
Mg (%)
Mn (ppm)
Na (%)
P (%)
S (ppm)
Si (%)
Ti (%)
As (ppm)
Ba (ppm)
Ce (ppm)
Easting
RESIDUAL

4200N


Co (ppm)
Cr (ppm)
Cu (ppm)
Ga (ppm)
La (ppm)
Nd (ppm)
Ni (ppm)
Pb (ppm)
Rb (ppm)
Sc (ppm)
Sr (ppm)
V (ppm)
Y (ppm)
Zn (ppm)
Zr (ppm)
Easting
RESIDUAL

Profile A (2550E 5000N) Floodplain: margin of palaeochannel, north of mineralization.

0-0.02	Orange (5YR 6/8). Sandy clay loam with a few dark ferruginous lag gravel (2-5 mm diameter) on the surface. Very fine roots. Fungal hyphae. Few soil peds.
0.02-0.07	Bright reddish brown (5YR 5/8). Silty loam grading to clay loam. Increasing quantities of carbonate (coatings on clay particles with some minor segregations). Some sub-angular, soil peds.
0.07-0.09	Reddish brown (2.5YR 4/8). Light to medium clay. Decreasing quantities of carbonate. Quartz chips. Some soil peds.
0.09-1.10	Reddish brown (2.5YR 4/8). Medium clay. Decreasing carbonate present as coarse mottles within clay. Grey nodules of clay (<2 cm). Some soil peds.

Calcite is present throughout the profile with some minor quantities of dolomite in the lower horizons. Quartz is abundant at the surface but decreases with depth. The Fe oxide minerals, hematite and possibly maghemite, are abundant throughout the profile. Kaolinite is present in low to moderate quantities.

Calcium and Mg distributions are closely related to the carbonate distribution. Magnesium, Na, Cl, S concentrations increase down the profile. Iron, Mn and K data are very variable with some Fe, Mn, Ti and many trace elements - see drill hole section diluted by the carbonate. Aluminium and Si concentrations do not fluctuate greatly. Phosphorous shows a strong tendency to decrease down the profile and is probably related to the distribution of organic material, rather than Fe oxides by which it is commonly adsorbed.

Gold contents increase down the profile and show two maxima at 0.3 m (62 ppb) and 0.8 m (58 ppb). It is significantly correlated with Ca, ($r = 0.995$) and Sr, and less significantly with Mg, Cl and Na. The distribution of Au may be explained by a general association with the carbonate, together with peak concentrations associated with Fe-rich segregations such as lag.

The following associations between major and trace elements are observed for this profile:

Al: Ti, Th, Hf, Sm (?), Sn (?), Yb, Zr
Ca: Au, Sr
Na: Cl, S, Br.
Fe: Mn, Ti, Bi, Cr, Ga, Ni, Pb, V, As, Cu, Sb, Sc.
K : P, Si, Rb, Zn, Cs.
Mg: Cl, Na, S, Ba, Sr, Ca (p).
P : Zn, Rb, S.
Si: Rb, Zn, Zr.

Concentrations of Ag, Cd, Eu, Ge, In, Ir, Mo, Nb, Se, Ta, U, W and Yb are at, or close to, their detection limit. Neodynium and Y distributions could not be related to any particular element or major mineral phase.

Profile B (2570E 5200N) Floodplain: margin of palaeochannel, north of mineralization

0-0.03	Orange (5YR 6/8). Sandy loam with a few dark ferruginous lag gravels) 2-5 mm diameter) on the surface. Some carbonate coatings on some of the lag. Fine rootlets. Fungal hyphae. Some peds, friable.
0.03-0.05	Orange (5YR 7/6), paler than above. Silty loam grading to light clay. Increasing quantities of carbonate (coatings on clay particles with some minor segregations). Some sub-angular, firm, soil peds (< 5 cm). More indurated than above.
0.05-0.09	Reddish brown (2.5YR 4/8) with light yellow orange (7.5YR 8/4) segregations. Light to medium clay. Decreasing quantities of carbonate. Considerable quantities of gravel-sized material. Some soil peds.

Carbonate is present throughout the profile. Calcite increases with depth to about 0.5 m then decreases as dolomite increases. Little calcite is present in the base of profile. Quartz is abundant at the surface but decreases with depth. Hematite decreases with increasing depth. Goethite is only present in minor quantities. Maghemite is abundant near the surface. Kaolinite is present in small amounts throughout the profile.

Calcium and Mg distributions are closely associated with the carbonate distribution. Calcium increases to reach a maxima at about 0.6 m then decreases, whereas Mg continues to increase with depth. Iron and Mn concentrations decrease sharply from the surface to stabilize at about 10 % and 400 ppm respectively. Aluminium decreases less sharply than Fe, and increases towards the base of the profile. Sodium and Cl distributions are strongly related and reflect the presence of a saline horizon superimposed upon the carbonate horizon. Potassium distribution appears positively correlated with the saline horizon. Phosphorus decreases with increasing depth. Silicon abundance decreases with depth, but increases slightly towards the base showing affinity with Al.

Gold is significantly correlated (r = 0.995) with Ca, Mg and Sr and less significantly with Cl and Na. Gold increases down the profile with a maxima of about 200 ppb at 0.8 m. The distribution of Au may be explained by a general association with calcite rather than dolomite.

Aluminium, Fe, K Mn, P, Si and Ti concentrations have been depleted by about 50 % following the infusion of carbonate. Although some Al may be substituted for Fe in goethite and hematite differences between the concentrations of Fe and Al assist in the interpretation of the associations with trace elements, suggesting adsorption onto Fe oxide minerals and clay minerals, respectively. The following associations between major and trace elements are observed for this profile:

Al: Si, La, Ni, Rb, Sm, Th, Y, Yb.
Ca: Cl, Mg, Na, Au, Ba (part), Br.
Na: Cl, Ca, Mg, As (part), Br.
Fe: Mn, Ti, As (part), Cr, Ga, Pb, Sb, Sc, V, Zn, Zr.
K : Cl, Na, Br, Eu, Rb.
Mg: S, Au, Sr, U.
P : Zn (?)

Concentrations of Ag, Bi, Cd, Cs, In, Ir Lu, Mo, Nb, Nd, Se, Ta and W are at, or close to, their detection limit. Copper distribution is not related to any particular element or major mineral phase but is clearly depleted by carbonate.

Profile C (2480E 4735N) Flooplain: Margin of palaeochannel, adjacent to mineralization.

0-0.02	Red (10R 5/8). Sandy loam with considerable dark lag (hard, ferruginous gravels 2 to 5 mm in diameter) on the surface. Fine rootlets. Fungal hyphae. Few peds.
0.02-0.15	Dark red (10R 3/6). Light to medium clay forming polyhedral, well structured peds (10-20 mm). No carbonate detected. Considerable lag. Many fine roots becoming fewer with depth.
0.15-0.25	Dark red (10R 3/6) silty clay with few light yellow orange (7.5YR 8/3) segregations as carbonate cutan fragments at the base of this horizon. Some soil peds coated with carbonate.
0.25-0.45	Dark red (10R 3/6) with many light yellow orange (7.5YR 8/3) carbonate segregations. *Very strongly cemented red-brown hardpan.* Increasing quantities of carbonate. Indurated carbonate filling partings (few millimetres wide) between brick-like blocks of the hardpan.
0.45-0.80	Reddish brown (2.5YR 4/8) with many light yellow orange (7.5YR 8/3) carbonate segregations. Medium clay forming sub-angular, well-structured peds (< 2 cm). Carbonate also present as coatings. Lag partially cemented within matrix of clay. Some quartz chips present.

Mineralogical examination indicates a quartz-rich topsoil with moderate amounts of quartz detected in the hardpan. The dominant feature of the profile is the presence of the hardpan horizon between 0.25 and 0.45 m surrounded by silty red clay. In the hardpan, Si and especially Al are abundant, whereas the Fe content is moderate, suggesting the cementing agents of the hardpan are alumino-silicates or poorly crystalline silica. The dominant mineral of the hardpan is kaolinite with some Fe-oxide, principally as hematite. The hardpan may represent an earlier soil surface horizon or a rudimentary illuvial "B". Additional, but smaller, quantities of kaolinite are found above and beneath the hardpan. Calcite abundance increases rapidly with depth below the hardpan with the greatest concentration near the base of the pit and no detectable dolomite is present. Fe oxides including maghemite are present in moderate amounts throughout the profile.

Calcium increases, steadily with depth, whereas Mg peaks in the hardpan. Magnesium is unlikely to be present as a carbonate mineral (e.g. dolomite, Mg-rich calcite) because there are (i) different distributions of Ca and Mg, (ii) no detectable amounts of dolomite and (iii) relatively large concentrations of Mg. XRD results suggest the Mg distribution may be due to palygorskite, although this could not be confirmed. This mineral has been found associated with arid, calcareous soils in Australia and elsewhere (Dixon *et al*, 1977). Magnesium may also be present in smectites or adsorbed as Mg^{2+} on clay particles. Evidence in support of the latter is suggested by its association with Na, K and Cl distributions. Aluminium, Fe, K, Mn, Na, Si and Ti decrease with depth which suggests they have been diluted (up to 50 %) by calcite.

Gold distribution appears to be related to at least two phases within the profile. Peak Au concentrations occur in the hardpan horizon (80 ppb) and then decrease sharply, the Au may be associated with evaporite elements (Na and Cl). before increasing again with the appearance of calcite. This distribution suggests associations with evaporite elements (Na and Cl) in the hardpan and with carbonate at depth.

The following associations between major and trace elements are observed for this profile.
Al: Cu, Ga, Ni, Rb, Zn, La Cs (?), La (?), part La, Lu, Nb, Sm, Y.
Ca: Sr; part Au
Na: Mg, Br, Cl, part Au
Fe: Cr, V, Sb; part As, Pb and Sc.
K : Cu, Rb, Eu; part Ba.
Mn: Th and Yb.
P : organic (?)
Ti: Zr and Hf.

Concentrations of Ag, Bi, Cd, Ge, In, Ir, Mo, Se, Ta, U and W are at, or close to, their detection limit.

Profile E (2700E 4530N): Residual soil: in soil anomaly probably derived from mineralization at Rocky Dam.

0-0.01	Dull reddish brown (5YR 5/4). Sandy clay with very few nodules on the surface. Carbonate present. Fine rootlets.
0.01-0.06	Dull reddish brown (5YR 5/4). Silty loam grading to light clay. Increasing quantities of carbonate (coatings on clay particles with some minor segregations). Some sub-angular, firm, soil peds (< 10 cm). Well structured. Rootlets present in higher parts of the horizon.
0.06-1.10	Dull reddish brown (5YR 4/4), darker and browner than above. Light to medium clay. Light yellow orange (7.5YR 8/4) segregations and as coatings on lag. Decreasing quantities of carbonate. Large (>10 cm) prismatic peds suggest presence of Na. Sample moist on collection.
1.10-1.90	Dull reddish brown (5YR 4/4). Light yellow (5Y 7/4) to bright green stains and segregations. Light to medium clay. Yellow/green segregations increase with depth to become >30% of the sample. No carbonate.

Calcite increases then rapidly decreases with depth below about 0.5 m with little below about 1 m. Some dolomite is present at the base of the carbonate horizon. Quartz decreases with depth from the surface. Kaolinite is present in moderate amounts throughout the profile. Hematite content is fairly constant whilst goethite increases rapidly below about 1 m. Palygorskite (?) is present in moderate amounts in the top half metre. Albite and chlorite are present in moderate to abundant quantities particularly in the lower part of the profile.

Calcium and Mg distributions are closely associated with the carbonate distribution. Calcium and Mg have maxima (11 %, 2.3 %) at about 0.5 m below which concentrations decrease rapidly. Some Mg will be present in palygorskite and chlorite. Iron and Na increase with depth. Potassium, and Mn generally decrease with depth. Silicon and Ti distributions are associated but this is most likely due to dilution by carbonate rather than a chemical association. Chlorine and S concentrations appear to be similar to that for Mg except for an unusual sharp decline in Cl at 0.7 m.

Gold does not show a strong association with any one particular major element or mineral phase. It is most abundant in the top metre of the profile and, therefore, shows a general association with the carbonate minerals. Maximum Au concentrations are 120 ppb at about 1 m, below which they decrease rapidly.

Associations identified between major elements and trace elements are summarised below:

Al: Sc (?).
Ca: As, Sr; part Ba, Au (?).
Na: Cr.
Fe: V; part Cr.
K : Zn, Rb, Pb, Zr, La (?), Ce (?) and Mn (?).
Mg: part Ba.
P : organic material.
S : Ce (?).
Si : Ti and Ga (?).

Concentrations of Nb are close to the detection limit. Copper distribution could not be related to any particular element or phase. Cobalt and Y distributions are closely related.

Profile F (2600E 4530N): Residual Soil: in soil anomaly probably derived from mineralization at Rocky Dam.

0-0.2	Orange (5YR 6/8). Sandy loam with small (<5 mm) peds. Some rootlets. Very few lag.
0.2-0.5	Heterogenous mix of siliceous, ferruginous and carbonate-rich sub-rounded nodules up to 8 cm. Many gravels covered by cutans of carbonate 1 to 2 mm thick. Carbonate-rich nodules deep pink in colour and indurated. Other carbonate-coated nodules when broken reveal large pieces of ferruginous material. Some nodules fracture to reveal near-white, thin (few microns) siliceous coating on a red to purply brown substrate.
0.5-1.0	Heterogenous mix of nodules (<10 cm) but tending towards a predominantly Fe-rich phase. Carbonate present as friable segregations (<5 cm).
1.0-1.6	Mainly Fe-rich pink to purple nodules with decreasing carbonate pockets.
1.6-2.1	Little carbonate present. Nodular segregations coloured purple, white, red, yellow and dark red. Also some greeny coloured clay.

The profile consists of a quartz-rich top soil, with light clays extensively diluted by carbonate minerals (calcite grading to dolomite and possibly some magnesite) in the top metre with progressively more kaolinite and Fe oxides in the second metre. Small quantities of albite occur in the top 30 cm presumably in lithorelics. Goethite dominates towards the base of the profile and seems to be associated with the variably coloured materials noted in the description above. Some palygorskite occurs at the base of the calcitic horizon.

The profile is dominated by the presence of carbonate which markedly decreases the concentrations of Si, Al, Mn, Ti, and in part Fe, Na and P. Calcium and Mg distributions closely follow those of calcite and dolomite with Mg having a maximum slightly below that of Ca. Silicon is enriched at the surface but decreases rapidly in concentration with depth before stabilizing below about 0.4 m. Iron generally increases with depth and is most concentrated (25 %) at the base of the soil pit. Sulphur distribution follows, in part, that of the carbonate and implies the presence of minor quantities of barite or gypsum.

Gold distribution follows closely that of the carbonates. The Au maximum (300 ppb) occurs at about 0.8 m with <30 ppb Au is present at the top and base of the profile.

The distribution of the mineral and major element phases is distinct so that reasonably confident assumptions over the distributions of the trace elements can be made. The following associations between major and trace elements are observed for this profile:

Ca: Sr.
Na: Cl (?)
Fe: Ga, V, Cu, and Sc (?); part As, Co
K : Ce, Rb and Zn.
Mg: Ba; part S
P : organic material (part).

Concentrations of Nb and Pb are at, or close to, their detection limit.

Profile G (1950E 4200N): Floodplain: background west of palaeochannel.

This profile forms part of a catena with profiles H, I, J and K along transverse 4200N from background in the floodplain to the west, to the soil anomaly on residual soil in the east.

0-0.01	Red (10R 5/8). Sandy loam with few lag fragments. Horizon finishes sharply. No carbonate detected. Rootlets present. Sharp contact with underlying horizon.
0.01-0.04	Dark red (10R 3/6). Light clay. Peds > 10 cm. Some lag. Some carbonate detected as fine (< 1 mm) segregations associated with rootlets.
0.04-0.06	Dark red (10R 3/6). Light clay. Carbonate horizon about 2 cm in width, slightly cemented. Quartz gravels up to 5 cm with lag. Rootlets present.
0.06-1.0	Dark red (10R 3/6). Light clay. Considerable quantities of lag, larger pieces of partially weathered rock (smooth, up to 5 cm, basaltic), quartz fragments, muscovite-rich segregations (yellow, friable). Some carbonate coatings on gravel at base of horizon.
1.0-1.5	Dark red (10R 3/6) with light yellow orange (7.5YR 8/3) carbonate segregations. Light clay. Considerable amount of carbonate present as segregations (up to 5 cm), coatings on gravel and as a cemented horizon (1.3 m). The carbonate horizon finishes abruptly. Rootlets present.
1.5-1.6	Reddish black (10R 2/1). Horizon consists almost entirely of a (semi-)continuous lens of dark lag.
1.6-1.8	Dark red (10R 3/6). Light clay. Moist on collection. More carbonate segregations and lag towards base of pit.

This profile is developed in heterogenesis sheetwash sediments and contains a variety of minerals of diverse origin. Quartz sand is abundant in the top few centimetres, but the profile is dominated by hematitic ferruginous gravels, locally diluted by quartz- and calcite-rich horizons. Goethite is more abundant in the clay. Of the carbonate minerals, only calcite was detected. Minor to moderate amounts of albite, chlorite, palygorskite, tremolite, talc and halite also occur.

The erratic distribution of the major elements reflects the heterogeneous mineralogy. Calcium and Mg are associated with the calcite-rich horizons, which suggests that Mg is contained in Mg-calcite, and Fe with the hematitic gravels. Aluminium content is greatest in the top 0.5 m and is associated with the < 2mm fraction dominated by clays; K, Mg and Na are also rich in this part of the profile. Silicon concentrations are greatest at the surface and decrease markedly with the appearance of the first carbonate horizon. Further maxima, lower in the profile, are related to quartz wash and the clay-rich horizon towards the base of the profile. The Mn-rich (≥ 2000 ppm) horizon consisting of about 40 % very dark coloured lag at 1.5 - 1.6 m is also enriched in Ce, Co, Cu, La, Ni and Y, confirming the association noted in the drill samples from the floodplain.

Gold concentrations are low, with a maximum concentration of 12 ppb. Each of the three maxima in the profile are coincident with, or adjacent to, the three Ca maxima.

Broad differences in the distribution of the minerals and major elements increases the reliability of the associations made between majors and the following trace elements:

Al: K, Si (part), Rb, Zn, moisture and <2mm size fraction.
Ca: Mg, S, Sr, Ba (part), moisture and >2mm size fraction (part).
Na: Cl, TDS, moisture.
Fe: S (part), Ti, As, Cr, Ga, La, Sc, V, Pb, lag; Cu (part), Nb (part) and Ni (part).
P : organic material (?).

The Zr distribution appears independent of elements or major phases.

Profile H (2100E 4200N): Floodplain: above minor mineralization in palaeochannel.

This profile forms part of a catena with profile G, I, J and K along transverse 4200N from background in the floodplain to the west, to soil anomaly on residual soils in the east.

0-0.05	Red (10R 5/8). Sandy loam with few lag. Sharp transition into next profile.
0.05-0.30	Dark red (10R 3/6) light to medium clay. Polyhedral (tending to columnar) peds, up to 30 mm. Many rootlets. No carbonate.
0.30-1.50	Dark red (10R 3/6) light to medium clay. Polyhedral peds >50 mm diameter. Few lag. Moist towards base of horizon. Carbonate present.
1.50-1.70	Gravel horizon consisting of dark brown to black ferruginous nodules with pale interstitual carbonates.
1.70-1.90	Pale yellow calcareous horizon immediately below the gravels.
1.90-2.10	Fine Fe-rich gravels with pale coloured cements. No carbonate.

The profile is developed in heterogeneous sheetwash sediments, consisting of up to 1.5 m of clays overlying ferruginous gravels. Carbonates are present in small quantities throughout the profile, except for the top few centimetres and below 1.90 m. Calcite is the dominant carbonate mineral with some dolomite present near the base. Kaolinite is abundant throughout the profile. Iron oxide minerals consist of hematite and goethite; hematite occurs throughout the profile in moderate concentrations, but goethite was not detected in the top 5 cm. Gypsum, anatase, albite, magnetite, chlorite and maghemite(?) were locally abundant.

Calcium has three maxima with the greatest (3.2 %) occurring towards the base of the pit. Magnesium demonstrates a slightly different distribution pattern to Ca with one broad maximum associated with the general distribution of carbonate in the clay-rich horizons and another (2.2 %) with Ca at 1.8 m. Aluminium, K, Na and Si concentrations are greatest in the clay rich horizons. Silicon has a maximum (32 %) at about 1.4 m, where it is associated with quartz-rich, angular gravel in which other major elements appear to be diluted. Iron and Ti increase markedly in the gravels below 1.5 m. Phosphorus decreases with depth.

Gold concentrations are generally <20ppb; the distribution has main features: (i) a general association of Au with the calcareous clay-rich horizons between 0.05 and 1.5 m; (ii) *a particularly rich sample (908 ppb), occurring at 0.4 m;* (iii) a second maxima occurring near the base and coincident with those for Ca and Mg. The extreme Au peak suggests the presence of detrital Au and implies derivation from Au-bearing units of the regolith located upstream. The remaining Au follows closely that of Mg and, in part, Ca, indicating a general association with carbonate.

Associations between trace elements and major components of the profile are partly obscured by the presence of concurrently similar distributions of carbonate (Ca and Mg) and clay minerals (defined by greater Al/Si ratios) in the upper part of the profile. However, clay minerals are not abundant towards the base of the profile, which is dominated by the presence of Fe oxide. Several elements show multiple associations. The following element associations have been interpreted from the geochemical profile diagrams (p = part):

Al: Ca (p), K (p), Na (p), Mg (p), Mn (p), Cl (p), TDS (p), moisture (p), Au (p), Cu (p), Ga (p), Ni (p), Rb (p), Sc (p), Zn (p), Zr and Nb (?).
Na: see K
Fe: Al (p), Ti, Cr, V, >2 mm, As, Cu (p), Ga (p), Sc (p)
K : Na (p), moisture and Rb.
Mg: (see Al), Cl (p), S (p), Ba, Ce, Co, La, Sr, Y and TDS (p).
P : organic material (?).

Profile I (2150E 4200N): Floodplain: above minor mineralization in palaeochannel.

This profile forms part of a catena with profile G, H, J and K along transverse 4200N from background in the floodplain to the west, to soil anomaly on residual soils in the east.

- 0-0.10 Orange (5 YR 6/8), sandy clay loam grading into dark red (10R 3/6) light clay. Rootlets. No carbonate. Few lag gravels.
- 0.1-1.2 Dark red (10R 3/6) light to medium clay. Uniform massive structure with some prismatic to polyhedral peds >5 cm. Carbonate present throughout horizon as segregations and coatings (light yellow orange (7.5YR 8/4)) decreasing with depth. Carbonate tends to form pockets. Few lag.
- 1.2-1.8 Semi-continuous sedimentary lenses of ferruginous and quartzose gravels, with quartz cobble to >8 cm and little matrix. Minor carbonate present as coatings and some segregations including rhizomorphs in upper part of horizon only.
- 1.8-2.0 Ferruginous and quartzose gravels with Fe oxide segregations. Minor carbonate; little clay.

This is similar to Profile H, being developed in heterogeneous sheetwash sediments, consisting of an upper clay-rich unit overlying gravels at 1.2 m. Quartz is present in considerable quantities at the surface but generally decreases with depth. Iron-oxide minerals are abundant throughout the profile but generally increase with depth. Hematite is more abundant than goethite. Kaolinite is most abundant in the top 1.2 m. Carbonate minerals are dominated by calcite with some dolomite in the base of the pit. No carbonate is present at the surface. Other minerals identified include rutile, anatase, tremolite, albite, maghemite(?), halite, magnetite and gypsum.

Silicon decreases with depth and has a distribution related to the quartz and fine fraction (<2 mm). Iron content is low (<9 %) in the fine fraction but increases sharply (to 23 - 41 %) with the appearance of the coarse fraction. Aluminium, Ca, Cl, K, Mg and Na are associated with the fine fraction. Manganese shows little variation with depth or size fraction. Phosphorus generally decreases with depth with a slight increase shown in the coarse fraction. Sulphur reaches a sharp maximum in the fine fraction (with Ba) and is probably associated with secondary barite. Titanium distribution appears strongly related to that of Fe and may be associated with Fe oxides as well as detrital.

Gold is dominantly associated with the clay-rich horizons, (i.e., indicated by the <2 mm fraction) and is probably associated with the carbonates. However, there is an unusually sharp maximum (80 ppb Au) in the gravel horizon which may be detrital in origin.

The minor element associations are dominated by the distributions of clays and gravels in the profile. The principal associations are (p = part):

Al: Fe (p), Mn (p), Si (p), K (p), Cl (p), Na (p), TDS (p), moisture (p), Au (p), Rb (p), Cu (p), Zr (p), La (p), Ni (p), Y (p)
Ca: Sr, Ba (p) and S (p).
Fe: Al (p), Mn (p), Ti, P (p), Cr, Sc, V, Ce (p), Ga (p), La (p), Ni (p), Zr (p) and Cu (p).
Mg: Ca (p), Zn, Ba (p), S (p), K (p), Cl (p), Na (p), TDS (p), moisture (p), Au (p) and Rb (p).
P : organic material (p?)

Profile J (2350E 4200N) Floodplain, east of palaeochannel. Situated in thick vegetation.

This profile forms part of a catena with profile G, H, I and K along transverse 4200N from background in the floodplain to the west, to soil anomaly on residual soils in the east.

0-0.5	Dark red (10R 3/6) medium to heavy clay. Little sandy material. Structure - strong, columnar to polyhedral peds up to 20 cm. Considerable organic material - roots, rootlets, charred material. No carbonate. Moist.
0.5-0.8	As above but with less organic material, smaller peds (lighter clay) and carbonate present as segregations (<2 mm) and coatings. Most segregations between 0.5 m and 0.6 m.
0.8-0.9	Horizon consists almost entirely of gravel and coarse sand sized material which is predominantly ferruginous in nature. Some quartz pieces and few carbonate segregations.
0.9-1.6	Yellow orange (7.5 YR 8/4) segregations with little matrix. Structure - few peds, friable, powdery. Carbonate-rich cementations dominate up to 4 cm. Some ferruginous cementations increasing with depth.

The profile is dominated by dark red mostly carbonate-poor clays in the top metre and by pale yellow calcareous clays from 1-2 m. These horizons are separated by a thin layer of ferruginous gravels. Calcite is the dominant carbonate mineral with some dolomite towards the base of the pit. Quartz is abundant in the first metre but declines rapidly below this. Kaolinite is slightly more abundant in the top metre. Iron oxide mineral (hematite and goethite) concentrations are variable but are most abundant in the gravel-rich horizon. Other minerals present include chlorite, gypsum, maghemite, palygorskite, tremolite, anatase and rutile.

Silicon distribution appears to follow closely that of the < 2 mm size fraction in the first metre where the dark red clays predominate. Concentrations in the top metre are from 25 to 28 % but fall sharply to a mean of about 10 % below 1 m. Calcium concentrations are poor in the first 0.5 m but increase sharply (as does Mg, Cl and Na) below this. A sharp decrease in Ca and Mg concentrations at 0.8 m corresponds with the occurrence of ferruginous gravels. All Ca and most Mg appear to be associated with the carbonate minerals but some Mg, and Al, K, Mn, Na and Si appear to be related to the <2 mm size fraction or the clay-rich horizon. Iron concentrations are generally low (<13 %) above 0.8 m and then increase sharply with a maximum of 33 % Fe in the gravel horizon. Elements commonly associated with Fe oxides (As, Cu, Ga, Mn, P, Sc, Ti, V) or hosted by resistant detrital minerals (REE, Cr, Pb, Ti, Zr) have maxima in the gravel horizon. Phosphorus concentrations generally decrease with depth; P abundance is no greater in this profile than others despite the presence of considerable quantities of organic material which suggests that P in organic material is readily leached and available for subsequent plant uptake.

Gold distribution follows closely that of Mg in the first metre but declines in concentration despite the richest carbonate horizon being towards the base of the pit. Gold concentrations vary from 10 ppb (in the gravel-rich horizon) to about 35 ppb at 0.4 m and at 1.0 m. A deeper pit would have enabled a detailed investigation of the relationship between Au and carbonate. The drill hole data suggests that Au concentrations generally decrease below the top metre, whilst carbonate tends to increase to reach a maximum between two and three metres.

The following associations between major and trace elements are observed for this profile. Some trends are dominated by the association with the gravel horizon noted above.

Al: part Fe K.
Ca: Cl, S, Sr, TDS; part Mg, Na.
Fe: Ti, As, Ce, Cr, Cu, Ga, La, Pb, V, Y; part Al, Mn, P, Co, Nb, Ni, Sc.
K : Si, moisture, Au, Ba, Rb, Zn; part Mg, Na, Al, Mn, P, Co, Ni, Sc (p).
P : organic material (part).

Profile K (2475E 4200N) Residual, on subdued spur.

This profile forms part of a catena with profile G, H, I and J along transverse 4200N from background in the floodplain to the west, to soil anomaly on residual soils in the east.

0-0.2 Dull reddish brown (5YR 5/4) sandy loam, with ferruginous gravels in top 10 cm. Structure - apedal, single grain. Considerable amount of carbonate, including pale orange (5YR 8/3) segregations (to 5 cm). .

0.2-1.0 Pale orange (5YR 8/3) calcareous sand silt with abundant segregations of carbonates, Fe oxides and silica. Carbonate nodules to >8 cm but all <3 cm at the base of the horizon.

1.0-2.0 Slightly redder pale orange (5YR 8/4). Silty clays with carbonates present as indurated segregations, to 8 cm diameter. Cementing agent appears to be clay and Fe-stained clays. Large Fe-rich segregations (>10 cm) towards base of pit.

Pedogenic carbonates, particularly calcite, dominate the profile; the greatest concentration occur at 0.2 m depth then decreases steadily in abundance with depth. Dolomite is less abundant but is the only carbonate mineral detected at the base of the pit. Quartz generally is abundant at the surface but decreases with depth. Hematite and goethite contents generally increase with depth; hematite is more abundant in the first metre, but goethite dominates in the second metre. Other minerals detected include anatase, palygorskite, albite, chlorite and magnetite.

Calcium concentrations generally follow those of calcite, increasing sharply to a maximum (19 %) at about 0.3 m before slowly decreasing to 3 % Ca at the base of the pit. Magnesium has three maxima, related to the presence of dolomitic nodules; the maximum Mg content coincides with that of Ca. Aluminium, Fe, Mn, Na, Si, Ti and V concentrations are diluted (>50 %) by the presence of carbonate and gradually increase with depth below the Ca maximum. Silicon content is greatest at the surface where it is associated with the sandy topsoil. Sodium and Cl increase sharply with depth and correspond with an increase in soluble salts (TDS). Phosphorus and K sharply decrease with depth but then stabilize.

Gold is correlated with Ca, reaching a maximum (250 ppb) at about 0.3 m and decreasing with depth to 100 ppb. There is little correlation between Mg and Au distributions deeper in the profile, suggesting that Au is associated with calcite rather than dolomite.
The following associations between major and trace elements are observed for this profile.

Al: Co, Ni, Sc (?).
Ca: Au Sr; part Mg.
Fe: As, Ti, Cr, Cu, Ga, V; part Ba, Ce, Al, Mn and La.
K : P, Rb, Zn; part Ba, Pb
Na: Cl, TDS.
P : organic material (?).

Sulphur, >2mm size fraction and moisture could not be associated with any particular component of the profile. Niobium concentrations are close to the detection limit.

Profile chemical data

NUMBER	PROFILE	DEPTH	MOISTURE %	+2mm %	TDS mS(1:5) Cond.	Al xrf %	Ca xrf %	Cl xrf ppm	Fe xrf %	K xrf %	Mg xrf %	Mn xrf(tr) ppm	Na xrf %	P xrf %	S xrf ppm	Si xrf %	Ti xrf(tr) %	Ag xrf(tr) ppm
04-4353	A	0.001	-	-	-	5.58	2.12	10	15.14	0.69	0.86	875	0.15	0.018	170	24.87	0.48	<1
04-4354	A	0.003	-	-	-	5.47	2.70	30	14.94	0.70	0.86	855	0.11	0.018	160	24.45	0.46	<1
04-4355	A	0.008	-	-	-	5.54	3.85	10	16.37	0.69	0.88	879	0.11	0.018	170	22.04	0.45	2
04-4356	A	0.015	-	-	-	5.48	4.48	60	16.96	0.67	0.93	864	0.10	0.018	180	20.95	0.43	3
04-4357	A	0.025	-	-	-	5.47	6.10	760	12.38	0.66	1.12	727	0.19	0.017	180	21.44	0.41	<1
04-4358	A	0.035	-	-	-	5.25	7.33	1420	10.96	0.64	1.24	669	0.27	0.014	230	21.21	0.38	<1
04-4359	A	0.045	-	-	-	5.22	7.82	1770	10.55	0.62	1.34	671	0.32	0.014	350	20.61	0.38	<1
04-4360	A	0.055	-	-	-	5.03	7.96	1980	12.87	0.56	1.34	726	0.34	0.011	430	19.30	0.37	<1
04-4361	A	0.065	-	-	-	5.07	8.83	2530	9.74	0.59	1.61	672	0.36	0.011	500	19.86	0.36	<1
04-4362	A	0.075	-	-	-	5.33	8.17	1950	8.82	0.62	1.73	627	0.41	0.010	550	20.74	0.37	2
04-4363	A	0.085	-	-	-	5.32	7.65	2790	12.77	0.57	1.75	664	0.61	0.009	530	19.10	0.39	3
04-4364	A	0.095	-	-	-	5.20	6.31	1810	17.73	0.48	1.69	844	0.39	0.008	470	17.45	0.42	2
04-4365	A	1.05	-	-	-	5.90	5.23	2040	12.51	0.59	1.90	588	0.45	0.008	470	20.60	0.41	<1
04-4379	B	0.001	-	-	-	4.65	2.96	20	22.57	0.42	0.67	1049	0.10	0.017	170	21.30	0.50	<1
04-4380	B	0.003	-	-	-	4.71	4.53	<10	19.21	0.46	0.75	1016	0.10	0.017	160	21.11	0.43	1
04-4381	B	0.008	-	-	-	4.68	5.28	90	17.45	0.48	0.81	920	0.10	0.015	190	20.99	0.43	<1
04-4382	B	0.015	-	-	-	4.45	6.70	430	14.94	0.45	0.90	778	0.19	0.015	210	21.21	0.38	2
04-4383	B	0.025	-	-	-	4.15	9.57	1630	12.46	0.42	1.14	702	0.25	0.014	330	19.57	0.34	2
04-4384	B	0.035	-	-	-	3.83	12.36	1910	9.38	0.39	1.44	550	0.30	0.013	430	18.30	0.30	2
04-4385	B	0.045	-	-	-	3.74	13.46	1850	8.76	0.38	1.63	530	0.31	0.010	490	17.55	0.29	2
04-4386	B	0.055	-	-	-	3.39	14.79	1480	8.32	0.32	2.45	463	0.23	0.008	540	14.63	0.26	1
04-4387	B	0.065	-	-	-	3.12	15.09	1720	8.19	0.28	4.12	460	0.23	0.007	510	11.87	0.24	5
04-4388	B	0.075	-	-	-	3.23	13.67	980	7.70	0.27	5.58	459	0.22	0.005	410	11.72	0.23	<1
04-4389	B	0.085	-	-	-	3.75	12.11	950	9.21	0.27	5.64	420	0.26	0.005	380	12.16	0.26	2
04-4390	B	0.095	-	-	-	3.96	11.36	1210	9.50	0.29	5.54	424	0.26	0.004	400	12.76	0.28	<1
04-4281	C	0.001	-	-	-	3.91	0.14	30	20.59	0.28	0.21	627	0.13	0.021	90	27.42	0.47	2
04-4282	C	0.003	-	-	-	6.16	0.26	320	17.30	0.36	0.46	881	0.23	0.018	100	25.59	0.53	<1
04-4283	C	0.008	-	-	-	7.92	0.37	1240	12.18	0.41	0.74	774	0.39	0.016	120	25.81	0.46	<1
04-4284	C	0.013	-	-	-	7.96	0.40	1980	14.20	0.45	0.88	821	0.42	0.016	190	24.35	0.46	<1
04-4285	C	0.02	-	-	-	7.84	0.82	2770	13.01	0.54	1.26	827	0.48	0.017	240	23.88	0.42	3
04-4286	C	0.03	-	-	-	7.66	1.22	4430	10.57	0.62	1.96	707	0.60	0.016	250	24.02	0.37	<1
04-4287	C	0.04	-	-	-	6.76	3.22	4440	9.88	0.53	2.12	595	0.60	0.013	370	23.12	0.33	<1
04-4288	C	0.048	-	-	-	5.91	5.34	4320	10.53	0.43	1.78	594	0.55	0.011	500	21.59	0.33	<1
04-4289	C	0.055	-	-	-	5.05	7.74	3440	10.40	0.35	1.59	561	0.47	0.010	560	20.14	0.31	<1
04-4290	C	0.065	-	-	-	5.00	8.10	1910	10.69	0.33	1.43	618	0.42	0.010	540	19.92	0.34	<1
04-4291	C	0.075	-	-	-	4.88	8.62	2750	12.00	0.32	1.28	617	0.39	0.010	520	19.19	0.33	2
04-4411	E	0.05	-	-	-	4.19	4.69	820	10.2	0.48	1.62	929	0.14	0.023	250	23.44	0.32	-
04-4413	E	0.25	-	-	-	3.91	10.03	990	8.2	0.39	2.17	720	0.27	0.016	560	19.47	0.26	-
04-4415	E.	0.45	-	-	-	3.95	10.98	2550	8.5	0.35	2.27	720	0.31	0.011	930	18.05	0.26	-
04-4417	E	0.65	-	-	-	4.82	6.93	1180	9.1	0.36	2.33	689	0.48	0.008	1270	20.43	0.31	-
04-4419	E	0.85	-	-	-	5.77	3.63	3350	9.0	0.38	2.14	651	0.63	0.008	1270	23.05	0.34	-
04-4421	E	1.1	-	-	-	6.90	0.16	2720	10.4	0.28	1.68	496	0.92	0.006	780	24.84	0.36	-
04-4422	E	1.3	-	-	-	6.96	0.14	2670	11.2	0.18	1.19	155	0.98	0.006	770	24.85	0.37	-
04-4425	E	1.9	-	-	-	5.73	0.09	2130	12.7	0.06	0.77	54	1.23	0.007	720	25.62	0.37	-
04-4426	F	0.05	-	-	-	4.48	0.82	20	12.4	0.28	0.78	620	0.07	0.018	110	27.12	0.46	-
04-4428	F	0.25	-	-	-	4.20	4.42	1360	16.1	0.17	0.98	581	0.11	0.016	270	17.46	0.36	-
04-4430	F	0.45	-	-	-	3.28	8.49	1290	10.8	0.12	2.16	318	0.12	0.007	470	14.13	0.28	-
04-4432	F	0.65	-	-	-	3.23	7.18	1570	10.4	0.12	3.28	271	0.14	0.007	510	14.25	0.27	-
04-4434	F	0.85	-	-	-	3.91	4.56	1490	17.9	0.07	2.77	217	0.16	0.007	560	13.05	0.32	-
04-4436	F	1.1	-	-	-	4.72	4.39	1730	12.7	0.08	2.89	194	0.20	0.006	490	15.79	0.40	-
04-4438	F	1.5	-	-	-	7.36	0.16	1910	12.7	0.06	0.55	279	0.25	0.005	460	24.59	0.73	-
04-4440	F	1.9	-	-	-	6.71	0.04	1310	23.8	0.02	0.22	170	0.19	0.011	540	17.67	0.61	-
04-4442	G	0.05	1.8	3.8	0.01	3.84	0.10	20	9.30	0.18	0.21	886	0.09	0.021	90	30.42	0.45	-
04-4443	G	0.15	3.1	7.5	0.01	4.50	0.11	5	10.02	0.20	0.25	973	0.08	0.018	80	28.68	0.48	-
04-4444	G	0.25	5.9	5.9	0.01	5.57	0.19	5	8.66	0.27	0.45	887	0.09	0.015	80	27.37	0.44	-
04-4445	G	0.35	9.6	4.3	0.01	6.07	0.28	5	6.15	0.34	0.83	723	0.12	0.010	70	27.91	0.40	-
04-4446	G	0.45	4.6	51.9	0.01	4.40	1.08	5	18.96	0.13	0.44	689	0.08	0.009	190	18.20	0.59	-
04-4447	G	0.55	3.8	50.1	0.01	4.26	0.82	5	18.92	0.09	0.35	590	0.08	0.008	160	19.25	0.52	-
04-4448	G	0.65	2.8	65.1	0.01	4.11	0.73	10	19.50	0.09	0.38	627	0.08	0.008	190	19.03	0.55	-
04-4449	G	0.75	3.6	47.4	0.01	3.96	0.51	10	19.25	0.08	0.36	593	0.08	0.008	130	20.01	0.55	-
04-4450	G	0.85	3.3	43.4	0.01	3.98	0.39	5	19.12	0.08	0.34	620	0.11	0.008	120	20.52	0.53	-
04-4451	G	0.95	3.1	43.7	0.11	3.65	0.89	50	12.19	0.10	0.44	550	0.17	0.006	100	26.83	0.37	-
04-4452	G	1.05	3.9	37.1	0.14	3.80	0.63	70	14.58	0.10	0.51	572	0.15	0.007	100	24.38	0.48	-
04-4453	G	1.15	5.0	56.4	0.46	4.55	1.11	130	24.66	0.08	0.55	874	0.15	0.006	170	12.73	0.77	-
04-4454	G	1.25	4.8	55.4	0.52	4.14	1.28	120	22.18	0.07	0.62	889	0.14	0.008	160	15.35	0.79	-
04-4455	G	1.35	10.1	32.6	0.88	5.23	1.55	380	14.51	0.16	0.99	887	0.24	0.001	210	19.10	0.57	-
04-4456	G	1.45	11.0	11.1	1.02	5.10	3.86	840	5.12	0.21	1.44	534	0.30	0.007	250	22.50	0.39	-
04-4457	G	1.55	6.3	38.5	0.90	5.27	0.67	460	19.26	0.10	0.60	2282	0.19	0.011	240	16.84	0.57	-
04-4458	G	1.65	4.5	46.8	0.84	4.97	0.13	320	23.09	0.06	0.33	553	0.16	0.008	230	15.46	0.69	-
04-4459	G	1.75	4.5	55.6	1.24	4.94	0.32	400	30.34	0.04	0.28	399	0.11	0.004	300	9.15	0.77	-

Profile chemical data (continued)

NUMBER	PROFILE	DEPTH	MOISTURE %	+2mm %	TDS mS(1:5) Cond.	Al xrf %	Ca xrf %	Cl xrf ppm	Fe xrf %	K xrf %	Mg xrf %	Mn xrf(tr) ppm	Na xrf %	P xrf %	S xrf ppm	Si xrf %	Ti xrf(tr) %	Ag xrf(tr) ppm
04-4460	H	0.025	1.3	1.7	0.04	3.86	0.11	70	7.66	0.21	0.27	755	0.14	0.022	170	31.97	0.47	-
04-4462	H	0.150	9.3	0.4	0.56	7.05	0.16	310	6.03	0.31	0.68	969	0.28	0.017	230	26.73	0.49	-
04-4464	H	0.350	11.6	0.4	2.43	6.48	0.96	650	5.68	0.36	1.07	822	0.34	0.014	2410	26.16	0.45	-
04-4466	H	0.550	12.2	0.4	3.94	6.54	1.45	2150	5.23	0.41	1.08	829	0.37	0.011	8220	24.87	0.47	-
04-4468	H	0.750	13.2	0.3	4.09	6.97	0.96	2070	5.15	0.44	1.09	910	0.41	0.011	6780	24.99	0.50	-
04-4470	H	0.950	13.4	0.2	3.65	7.19	0.78	2260	5.23	0.44	1.11	908	0.43	0.010	2550	25.31	0.50	-
04-4472	H	1.250	12.8	0.1	3.03	6.46	1.69	2380	4.78	0.37	1.07	845	0.41	0.008	5160	25.41	0.44	-
04-4473	H	1.400	7.5	0.2	1.89	4.21	0.76	1190	5.18	0.22	0.63	587	0.29	0.005	3490	31.58	0.36	-
04-4474	H	1.600	9.2	6.6	2.82	4.47	1.78	1920	6.08	0.18	1.33	1465	0.34	0.004	7290	26.51	0.43	-
04-4475	H	1.800	8.4	8.1	2.10	4.63	2.08	2430	7.07	0.16	1.71	875	0.32	0.003	7930	24.14	0.42	-
04-4476	H	2.000	4.6	47.8	2.24	5.29	0.04	950	29.06	0.04	0.16	328	0.13	0.007	6670	10.45	0.76	-
04-4477	I	0.025	1.07	2.68	0.09	3.09	0.11	30	9.10	0.17	0.22	573	0.11	0.015	110	31.97	0.43	-
04-4479	I	0.15	6.00	1.35	0.78	5.83	0.15	470	6.71	0.29	0.60	856	0.25	0.014	220	28.58	0.44	-
04-4481	I	0.35	9.49	1.49	2.51	5.76	2.38	1920	5.83	0.32	1.01	765	0.32	0.015	3010	24.59	0.39	-
04-4483	I	0.55	9.51	1.50	2.97	5.91	2.45	1760	5.70	0.35	1.06	790	0.33	0.010	4030	24.09	0.43	-
04-4485	I	0.75	11.13	1.07	2.86	6.48	1.56	2030	5.63	0.39	1.04	840	0.39	0.011	2980	24.96	0.45	-
04-4487	I	0.95	10.24	0.86	2.92	6.79	1.12	1890	5.52	0.40	1.02	886	0.39	0.010	2830	25.60	0.47	-
04-4488	I	1.1	10.20	1.61	2.67	6.50	1.65	1730	5.25	0.37	1.01	822	0.38	0.007	2250	25.43	0.43	-
04-4489	I	1.3	4.86	40.28	2.47	4.91	1.59	860	15.40	0.15	0.62	701	0.22	0.008	2210	19.42	0.50	-
04-4490	I	1.5	4.02	51.62	2.18	5.16	0.60	690	23.91	0.06	0.45	801	0.17	0.010	2220	13.63	0.63	-
04-4491	I	1.7	3.51	48.26	1.50	4.63	0.14	640	27.57	0.06	0.33	712	0.13	0.011	4600	12.19	0.76	-
04-4492	I	1.9	4.58	51.20	2.04	4.64	0.50	800	19.56	0.09	0.56	514	0.21	0.006	5070	18.01	0.51	-
04-4493	J	0.05	3.74	2.26	0.10	5.97	0.16	5	8.44	0.29	0.37	1009	0.09	0.020	250	27.16	0.49	-
04-4495	J	0.25	6.40	4.98	0.11	6.32	0.23	5	8.34	0.30	0.55	1002	0.09	0.013	180	26.25	0.46	-
04-4496	J	0.35	9.24	1.99	0.10	6.50	0.29	5	6.69	0.33	0.82	966	0.10	0.011	190	26.37	0.45	-
04-4497	J	0.45	10.34	1.39	0.25	6.28	0.44	5	6.28	0.32	0.85	845	0.10	0.013	180	26.69	0.43	-
04-4499	J	0.65	8.18	1.18	0.22	5.26	2.73	20	5.15	0.25	0.82	729	0.10	0.009	240	25.74	0.35	-
04-4500	J	0.75	7.28	5.33	0.26	5.00	2.26	10	6.79	0.22	0.69	684	0.11	0.006	220	25.89	0.35	-
04-4501	J	0.85	4.29	34.76	0.27	4.58	0.26	30	22.37	0.09	0.32	756	0.09	0.010	170	16.46	0.70	-
04-4502	J	0.95	5.55	48.29	0.60	5.63	3.88	50	16.90	0.05	0.88	416	0.06	0.001	230	11.67	0.49	-
04-4503	J	1.1	5.70	36.60	0.70	6.15	7.24	140	10.64	0.03	0.77	335	0.07	0.002	220	11.01	0.30	-
04-4504	J	1.3	6.00	43.35	1.13	5.69	6.79	190	14.00	0.02	0.99	226	0.10	0.001	270	9.36	0.43	-
04-4505	J	1.5	5.79	40.50	1.55	4.93	7.72	300	9.62	0.04	1.93	351	0.17	0.001	300	10.51	0.26	-
04-4506	K	0.05	1.84	39.2	0.43	4.67	4.54	5	14.84	0.10	0.48	377	0.03	0.015	340	15.26	0.39	-
04-4508	K	0.25	2.17	71.3	0.67	3.24	12.49	10	7.32	0.05	1.51	152	0.00	0.008	490	7.84	0.21	-
04-4510	K	0.45	2.35	76.4	1.20	3.86	11.68	5	7.64	0.03	2.27	82	0.03	0.001	370	6.73	0.23	-
04-4512	K	0.65	3.73	70.3	1.06	5.95	7.42	40	12.46	0.03	1.32	106	0.02	0.001	390	9.04	0.34	-
04-4514	K	0.85	3.49	62.3	1.17	5.99	6.07	90	14.12	0.04	1.08	150	0.03	0.001	450	9.86	0.41	-
04-4516	K	1.1	2.75	84.9	1.78	6.25	4.53	130	15.50	0.02	1.93	138	0.04	0.001	340	8.49	0.44	-
04-4517	K	1.3	3.88	71.2	1.29	7.27	4.13	180	15.49	0.02	1.02	142	0.06	0.002	360	9.77	0.47	-
04-4518	K	1.5	3.14	93.9	4.02	7.28	3.28	150	15.61	0.02	1.83	148	0.08	0.001	280	9.35	0.34	-
04-4519	K	1.8	2.86	92.4	3.95	8.63	1.91	260	15.32	0.02	1.26	183	0.11	0.001	250	11.42	0.40	-

Profile chemical data (continued)

NUMBER	PROFILE	DEPTH	As xrf(tr) ppm	Au inaa ppb	Ba xrf(tr) ppm	Bi xrf(tr) ppm	Br inaa ppm	Cd xrf(tr) ppm	Ce xrf(tr) ppm	Co xrf(tr) ppm	Cr xrf(tr) ppm	Cs xrf(tr) ppm	Cu xrf(tr) ppm	Eu inaa ppm	Ga xrf(tr) ppm	Ge xrf(tr) ppm	Hf inaa ppm	In xrf(tr) ppm
4353	A	0.001	17	22	198	<1	2	<1	39	41	1222	1	60	0.800	22	2	4.31	1
4354	A	0.003	19	17	178	<1	4	<1	51	31	1198	1	71	0.830	20	<1	3.95	<1
4355	A	0.008	10	23	194	<1	7	<1	37	21	1208	4	66	0.730	20	<1	3.81	<1
4356	A	0.015	20	37	186	2	12	1	42	34	1117	1	78	0.640	20	<1	3.72	<1
4357	A	0.025	14	61	171	1	19	<1	42	19	998	1	71	0.750	17	<1	3.56	<1
4358	A	0.035	8	52	157	<1	21	1	43	23	832	<1	71	0.790	18	1	3.55	1
4359	A	0.045	19	50	153	<1	22	<1	38	26	816	<1	69	0.790	16	2	3.56	1
4360	A	0.055	16	46	146	<1	24	<1	37	19	945	<1	71	0.680	17	1	3.55	1
4361	A	0.065	16	48	200	1	25	2	40	20	742	<1	63	0.680	15	1	3.29	<1
4362	A	0.075	11	58	220	<1	23	<1	38	27	713	<1	63	0.740	15	<1	3.59	4
4363	A	0.085	13	52	207	<1	24	4	39	28	890	<1	62	0.660	17	<1	3.30	3
4364	A	0.095	28	49	202	3	20	<1	43	31	1280	<1	65	0.800	21	2	3.59	2
4365	A	1.05	14	46	221	<1	20	2	38	32	1000	<1	55	0.670	17	1	3.90	2
4379	B	0.001	23	21	186	1	1	4	55	37	1557	1	59	0.750	20	2	4.69	4
4380	B	0.003	23	29	185	<1	4	<1	51	31	1294	1	64	0.640	18	2	3.73	4
4381	B	0.008	17	33	184	1	9	<1	45	28	1168	<1	64	0.680	19	<1	3.70	<1
4382	B	0.015	14	57	166	1	17	1	47	30	983	<1	60	0.850	17	2	3.70	2
4383	B	0.025	17	80	154	1	25	<1	48	21	852	<1	64	0.740	13	2	3.28	1
4384	B	0.035	21	79	146	<1	28	<1	30	18	678	<1	59	0.750	11	<1	2.83	2
4385	B	0.045	20	91	225	1	28	3	39	23	632	<1	55	0.590	12	<1	2.97	1
4386	B	0.055	11	141	425	<1	23	1	34	20	629	<1	50	0.570	10	<1	2.78	2
4387	B	0.065	12	183	527	1	19	1	24	18	603	<1	52	0.560	10	<1	2.24	2
4388	B	0.075	14	192	338	3	16	<1	29	21	571	<1	50	0.500	10	1	2.15	2
4389	B	0.085	14	165	266	1	14	<1	33	19	681	<1	47	0.650	13	<1	2.66	4
4390	B	0.095	15	150	378	1	14	1	40	17	675	<1	46	0.590	12	<1	2.35	2
4281	C	0.001	26	11	101	1	<2	<1	35	27	1758	<1	53	0.670	17	1	4.33	3
4282	C	0.003	15	25	118	1	6	1	44	36	1535	3	70	1.050	21	<1	4.40	3
4283	C	0.008	17	49	111	1	14	4	46	37	1154	2	77	1.010	24	3	3.91	1
4284	C	0.013	17	51	156	1	19	<1	43	40	1336	2	85	0.950	24	2	3.73	3
4285	C	0.02	18	75	190	1	22	<1	48	41	1238	2	89	0.890	25	<1	3.56	3
4286	C	0.03	14	81	183	<1	30	1	43	32	942	1	94	0.960	22	<1	3.45	<1
4287	C	0.04	11	73	138	1	31	<1	42	28	905	1	82	0.920	19	2	3.07	1
4288	C	0.048	15	43	126	<1	28	<1	37	29	980	<1	75	0.830	17	1	2.98	1
4289	C	0.055	15	48	132	<1	23	1	33	26	945	<1	68	0.760	16	1	2.81	<1
4290	C	0.065	22	62	145	<1	25	1	36	26	1005	<1	66	0.830	16	<1	3.10	1
4291	C	0.075	16	70	194	<1	22	1	39	23	1071	<1	72	0.720	15	2	2.80	5
04-4411	E	0.05	10	45	142	-	-	-	36	34	1525	-	61	-	13	-	-	-
04-4413	E	0.25	15	84	118	-	-	-	26	29	1153	-	67	-	12	-	-	-
04-4415	E	0.45	13	66	233	-	-	-	28	30	1243	-	60	-	12	-	-	-
04-4417	E	0.65	11	99	154	-	-	-	34	48	1422	-	58	-	14	-	-	-
04-4419	E	0.85	9	92	140	-	-	-	37	82	1563	-	61	-	15	-	-	-
04-4421	E	1.1	5	116	129	-	-	-	31	134	2018	-	62	-	15	-	-	-
04-4422	E	1.3	7	45	96	-	-	-	11	48	2372	-	57	-	16	-	-	-
04-4425	E	1.9	4	6	12	-	-	-	11	28	2889	-	47	-	16	-	-	-
04-4426	F	0.05	14	31	138	-	-	-	33	29	1556	-	60	-	16	-	-	-
04-4428	F	0.25	13	119	133	-	-	-	25	39	1408	-	114	-	21	-	-	-
04-4430	F	0.45	12	242	111	-	-	-	18	24	734	-	90	-	11	-	-	-
04-4432	F	0.65	8	294	189	-	-	-	22	17	673	-	72	-	14	-	-	-
04-4434	F	0.85	10	289	222	-	-	-	20	35	765	-	120	-	18	-	-	-
04-4436	F	1.1	4	169	94	-	-	-	17	21	619	-	76	-	17	-	-	-
04-4438	F	1.5	6	40	63	-	-	-	14	46	564	-	87	-	23	-	-	-
04-4440	F	1.9	9	25	99	-	-	-	10	30	710	-	138	-	27	-	-	-
04-4442	G	0.05	9	5.9	115	-	-	-	35	26	1061	-	59	-	16	-	-	-
04-4443	G	0.15	15	2.5	127	-	-	-	41	30	1101	-	64	-	17	-	-	-
04-4444	G	0.25	8	8.2	161	-	-	-	42	25	943	-	79	-	20	-	-	-
04-4445	G	0.35	10	12	167	-	-	-	35	28	711	-	75	-	18	-	-	-
04-4446	G	0.45	36	2.5	170	-	-	-	48	27	2066	-	82	-	27	-	-	-
04-4447	G	0.55	30	2.5	160	-	-	-	44	29	1867	-	94	-	22	-	-	-
04-4448	G	0.65	36	2.5	167	-	-	-	48	26	2012	-	90	-	24	-	-	-
04-4449	G	0.75	35	2.5	151	-	-	-	50	28	2032	-	80	-	24	-	-	-
04-4450	G	0.85	37	8.5	137	-	-	-	47	25	1993	-	77	-	23	-	-	-
04-4451	G	0.95	22	2.5	111	-	-	-	36	27	1127	-	70	-	16	-	-	-
04-4452	G	1.05	22	2.5	106	-	-	-	38	38	1434	-	64	-	21	-	-	-
04-4453	G	1.15	35	2.5	149	-	-	-	83	49	2627	-	83	-	30	-	-	-
04-4454	G	1.25	35	2.5	153	-	-	-	110	48	2474	-	80	-	29	-	-	-
04-4455	G	1.35	23	2.5	177	-	-	-	100	50	1503	-	79	-	24	-	-	-
04-4456	G	1.45	11	3.5	152	-	-	-	45	35	640	-	59	-	16	-	-	-
04-4457	G	1.55	43	2.5	205	-	-	-	242	179	2049	-	107	-	24	-	-	-
04-4458	G	1.65	45	2.5	86	-	-	-	74	34	2478	-	100	-	28	-	-	-
04-4459	G	1.75	49	2.5	175	-	-	-	37	4	3383	-	81	-	31	-	-	-

Profile chemical data (continued)

NUMBER	PROFILE	DEPTH	As xrf(tr) ppm	Au inaa ppb	Ba xrf(tr) ppm	Bi xrf(tr) ppm	Br inaa ppm	Cd xrf(tr) ppm	Ce xrf(tr) ppm	Co xrf(tr) ppm	Cr xrf(tr) ppm	Cs xrf(tr) ppm	Cu xrf(tr) ppm	Eu inaa ppm	Ga xrf(tr) ppm	Ge xrf(tr) ppm	Hf inaa ppm	In xrf(tr) ppm
04-4460	H	0.025	13	5.6	120	-	-	-	38	27	880	-	44	-	14	-	-	-
04-4462	H	0.150	10	8.7	134	-	-	-	45	29	708	-	84	-	22	-	-	-
04-4464	H	0.350	12	908	195	-	-	-	40	26	660	-	81	-	21	-	-	-
04-4466	H	0.550	10	12.1	209	-	-	-	44	31	608	-	73	-	21	-	-	-
04-4468	H	0.750	7	13.7	190	-	-	-	44	36	597	-	77	-	20	-	-	-
04-4470	H	0.950	14	14.3	208	-	-	-	46	34	618	-	76	-	21	-	-	-
04-4472	H	1.250	10	13.4	236	-	-	-	40	35	603	-	71	-	18	-	-	-
04-4473	H	1.400	13	11.5	141	-	-	-	28	17	641	-	50	-	12	-	-	-
04-4474	H	1.600	13	14.9	131	-	-	-	98	48	768	-	58	-	14	-	-	-
04-4475	H	1.800	12	18.7	357	-	-	-	107	68	887	-	58	-	16	-	-	-
04-4476	H	2.000	49	2.5	108	-	-	-	29	36	3136	-	89	-	34	-	-	-
04-4477	I	0.025	20	6	108	-	-	-	32	18	1065	-	43	-	12	-	-	-
04-4479	I	0.15	13	27	139	-	-	-	39	27	811	-	75	-	20	-	-	-
04-4481	I	0.35	15	36	161	-	-	-	33	24	685	-	78	-	17	-	-	-
04-4483	I	0.55	11	31	272	-	-	-	40	29	649	-	77	-	18	-	-	-
04-4485	I	0.75	8	27	218	-	-	-	39	31	645	-	74	-	19	-	-	-
04-4487	I	0.95	10	25	221	-	-	-	42	34	670	-	74	-	21	-	-	-
04-4488	I	1.1	10	20	207	-	-	-	43	33	667	-	65	-	20	-	-	-
04-4489	I	1.3	27	15	141	-	-	-	45	30	1576	-	87	-	24	-	-	-
04-4490	I	1.5	46	78	136	-	-	-	68	33	2559	-	116	-	27	-	-	-
04-4491	I	1.7	60	3	143	-	-	-	65	31	3123	-	99	-	30	-	-	-
04-4492	I	1.9	47	3	160	-	-	-	41	31	2202	-	84	-	21	-	-	-
04-4493	J	0.05	15	20	189	-	-	-	45	31	1003	-	74	-	21	-	-	-
04-4495	J	0.25	15	27	209	-	-	-	46	32	989	-	80	-	21	-	-	-
04-4496	J	0.35	10	35	233	-	-	-	40	33	750	-	83	-	22	-	-	-
04-4497	J	0.45	13	35	234	-	-	-	40	33	746	-	76	-	22	-	-	-
04-4499	J	0.65	13	29	228	-	-	-	29	26	625	-	63	-	15	-	-	-
04-4500	J	0.75	15	31	200	-	-	-	32	26	784	-	64	-	15	-	-	-
04-4501	J	0.85	44	10	191	-	-	-	69	26	2542	-	97	-	29	-	-	-
04-4502	J	0.95	33	34	119	-	-	-	34	29	2565	-	80	-	25	-	-	-
04-4503	J	1.1	36	30	89	-	-	-	17	43	2138	-	74	-	21	-	-	-
04-4504	J	1.3	38	16	99	-	-	-	22	51	2804	-	77	-	25	-	-	-
04-4505	J	1.5	36	21	145	-	-	-	30	40	1904	-	63	-	18	-	-	-
04-4506	K	0.05	49	56	96	-	-	-	25	41	3530	-	64	-	22	-	-	-
04-4508	K	0.25	25	245	56	-	-	-	19	34	1701	-	64	-	11	-	-	-
04-4510	K	0.45	28	209	38	-	-	-	11	28	1940	-	56	-	13	-	-	-
04-4512	K	0.65	39	216	58	-	-	-	20	42	2898	-	83	-	21	-	-	-
04-4514	K	0.85	47	177	63	-	-	-	21	55	3688	-	83	-	25	-	-	-
04-4516	K	1.1	53	154	64	-	-	-	32	86	4056	-	96	-	27	-	-	-
04-4517	K	1.3	51	156	58	-	-	-	27	69	4141	-	90	-	29	-	-	-
04-4518	K	1.5	56	107	53	-	-	-	22	89	5042	-	93	-	25	-	-	-
04-4519	K	1.8	56	97	39	-	-	-	24	104	4887	-	95	-	25	-	-	-

Profile chemical data (continued)

NUMBER	PROFILE	DEPTH	Ir	La	Lu	Mo	Nb	Nd	Ni	Pb	Rb	Sb	Sc	Se	Sm	Sr	Ta	Th	U
			inaa	xrf(tr)	inaa	xrf(tr)	xrf(tr)	xrf(tr)	xrf(tr)	xrf(tr)	xrf(tr)	xrf(tr)	xrf(tr)	xrf(tr)	inaa	xrf(tr)	inaa	inaa	inaa
			ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
4353	A	0.001	<20	31	0.28	2	5	11	166	17	39	3	28	<1	4.07	61	<1	11.80	<2
4354	A	0.003	<20	37	0.35	2	7	12	166	14	37	3	28	1	4.03	62	<1	11.10	<2
4355	A	0.008	<20	26	0.30	5	7	17	170	12	34	1	31	1	4.07	81	<1	11.30	<2
4356	A	0.015	<20	24	0.28	5	4	17	165	16	34	4	32	1	4.10	92	<1	10.80	<2
4357	A	0.025	<20	25	0.28	<1	5	13	157	11	37	1	30	1	3.83	118	<1	10.30	<2
4358	A	0.035	<20	24	0.23	<1	<1	14	149	11	36	<1	30	<1	3.76	144	<1	9.94	<2
4359	A	0.045	<20	26	0.30	2	<1	13	148	12	33	2	30	2	3.86	165	<1	10.10	<2
4360	A	0.055	<20	18	0.31	1	2	11	150	12	32	<1	31	1	3.83	178	<1	9.51	2.01
4361	A	0.065	<20	23	0.29	2	8	15	138	7	30	1	29	2	3.82	208	<1	9.46	<2
4362	A	0.075	<20	23	0.29	1	9	14	134	11	33	4	31	2	3.79	202	<1	9.44	2.96
4363	A	0.085	<20	15	0.27	3	6	9	147	10	29	3	31	1	3.70	189	<1	9.60	3.78
4364	A	0.095	<20	26	0.28	2	<1	11	161	13	24	2	32	2	3.58	159	1.61	10.40	4.48
4365	A	1.05	<20	22	0.28	3	<1	11	153	11	29	2	30	2	3.77	161	1.33	10.60	4.34
4379	B	0.001	<20	32	0.31	1	6	11	142	17	23	2	30	1	3.98	75	<1	12.30	<2
4380	B	0.003	<20	31	0.27	2	3	13	144	17	26	5	31	<1	3.91	98	1.46	11.10	<2
4381	B	0.008	<20	31	0.29	4	4	10	134	15	25	<1	30	1	3.83	117	<1	10.50	<2
4382	B	0.015	<20	24	0.26	1	5	11	127	14	26	1	28	1	3.61	154	<1	9.69	<2
4383	B	0.025	<20	14	0.25	2	5	12	116	11	25	3	28	1	3.33	227	<1	9.00	<2
4384	B	0.035	<20	15	0.25	<1	1	15	104	9	22	<1	29	<1	3.02	304	<1	7.58	<2
4385	B	0.045	<20	22	0.20	1	5	9	102	10	22	4	30	1	2.90	356	<1	7.60	<2
4386	B	0.055	<20	14	<0.2	2	2	9	93	9	19	3	30	<1	2.68	447	<1	6.97	3.44
4387	B	0.065	<20	22	<0.2	<1	2	7	91	5	15	3	29	<1	2.42	474	<1	6.10	7.33
4388	B	0.075	<20	12	<0.2	2	3	13	84	7	12	3	28	2	2.43	439	<1	6.03	8.87
4389	B	0.085	<20	11	<0.2	1	2	5	101	9	13	1	26	1	2.58	369	<1	6.60	11.30
4390	B	0.095	<20	15	<0.2	<1	1	13	105	8	13	1	30	2	2.77	344	1.10	7.38	12.40
4281	C	0.001	<20	28	0.29	3	3	13	135	15	20	8	26	<1	3.79	21	<1	11.60	<2
4282	C	0.003	<20	32	0.35	1	7	14	204	10	33	2	30	1	4.55	40	1.61	12.70	<2
4283	C	0.008	<20	29	0.34	<1	7	17	237	13	39	2	32	<1	4.61	52	<1	11.60	<2
4284	C	0.013	<20	33	0.35	3	6	20	255	14	40	<1	33	1	4.81	58	1.02	11.90	<2
4285	C	0.02	<20	34	0.32	<1	7	18	286	11	44	<1	33	2	4.60	73	<1	10.50	<2
4286	C	0.03	<20	31	0.25	2	5	16	252	10	47	4	30	1	4.06	84	<1	10.00	<2
4287	C	0.04	<20	23	0.27	1	5	16	209	11	39	<1	28	2	4.03	95	<1	9.38	<2
4288	C	0.048	<20	22	0.26	<1	3	16	189	11	32	2	30	1	4.20	109	<1	8.75	<2
4289	C	0.055	<20	28	0.26	<1	4	14	164	12	27	5	31	<1	3.86	125	<1	8.50	<2
4290	C	0.065	<20	25	0.31	2	<1	11	164	11	26	3	30	1	3.98	135	<1	8.54	<2
4291	C	0.075	<20	18	0.28	4	2	17	174	10	25	3	30	<1	4.13	147	<1	8.66	<2
04-4411	E	0.05	-	18	-	-	4	-	272	13	25	-	27	-	-	99	-	-	-
04-4413	E	0.25	-	15	-	-	4	-	240	9	23	-	28	-	-	214	-	-	-
04-4415	E	0.45	-	18	-	-	5	-	246	6	21	-	29	-	-	240	-	-	-
04-4417	E	0.65	-	18	-	-	3	-	335	7	20	-	30	-	-	162	-	-	-
04-4419	E	0.85	-	21	-	-	4	-	452	7	21	-	30	-	-	110	-	-	-
04-4421	E	1.1	-	18	-	-	3	-	573	7	14	-	31	-	-	50	-	-	-
04-4422	E	1.3	-	10	-	-	2	-	409	4	7	-	34	-	-	44	-	-	-
04-4425	E	1.9	-	10	-	-	3	-	298	1	3	-	30	-	-	37	-	-	-
04-4426	F	0.05	-	20	-	-	4	-	188	12	29	-	29	-	-	52	-	-	-
04-4428	F	0.25	-	21	-	-	4	-	169	8	18	-	42	-	-	148	-	-	-
04-4430	F	0.45	-	9	-	-	7	-	120	3	12	-	36	-	-	273	-	-	-
04-4432	F	0.65	-	13	-	-	4	-	111	3	12	-	30	-	-	257	-	-	-
04-4434	F	0.85	-	14	-	-	1	-	117	4	6	-	33	-	-	160	-	-	-
04-4436	F	1.1	-	14	-	-	5	-	107	5	7	-	40	-	-	145	-	-	-
04-4438	F	1.5	-	15	-	-	3	-	148	1	5	-	47	-	-	38	-	-	-
04-4440	F	1.9	-	8	-	-	6	-	115	3	3	-	46	-	-	31	-	-	-
04-4442	G	0.05	-	21	-	-	5	-	120	12	22	-	22	-	-	22	-	-	-
04-4443	G	0.15	-	24	-	-	3	-	147	14	26	-	26	-	-	26	-	-	-
04-4444	G	0.25	-	27	-	-	4	-	173	13	34	-	28	-	-	35	-	-	-
04-4445	G	0.35	-	27	-	-	5	-	189	10	38	-	25	-	-	47	-	-	-
04-4446	G	0.45	-	41	-	-	5	-	158	14	17	-	36	-	-	41	-	-	-
04-4447	G	0.55	-	40	-	-	6	-	144	18	9	-	36	-	-	35	-	-	-
04-4448	G	0.65	-	34	-	-	2	-	195	17	9	-	34	-	-	31	-	-	-
04-4449	G	0.75	-	40	-	-	1	-	151	19	10	-	35	-	-	30	-	-	-
04-4450	G	0.85	-	37	-	-	1	-	144	15	7	-	34	-	-	30	-	-	-
04-4451	G	0.95	-	26	-	-	5	-	122	7	10	-	26	-	-	38	-	-	-
04-4452	G	1.05	-	38	-	-	6	-	127	12	13	-	28	-	-	36	-	-	-
04-4453	G	1.15	-	72	-	-	6	-	174	21	8	-	44	-	-	81	-	-	-
04-4454	G	1.25	-	57	-	-	11	-	168	16	6	-	39	-	-	64	-	-	-
04-4455	G	1.35	-	53	-	-	3	-	178	13	16	-	34	-	-	63	-	-	-
04-4456	G	1.45	-	28	-	-	4	-	147	10	21	-	27	-	-	89	-	-	-
04-4457	G	1.55	-	98	-	-	5	-	294	19	11	-	39	-	-	50	-	-	-
04-4458	G	1.65	-	32	-	-	2	-	157	25	5	-	44	-	-	29	-	-	-
04-4459	G	1.75	-	27	-	-	5	-	133	27	4	-	48	-	-	33	-	-	-

Profile chemical data (continued)

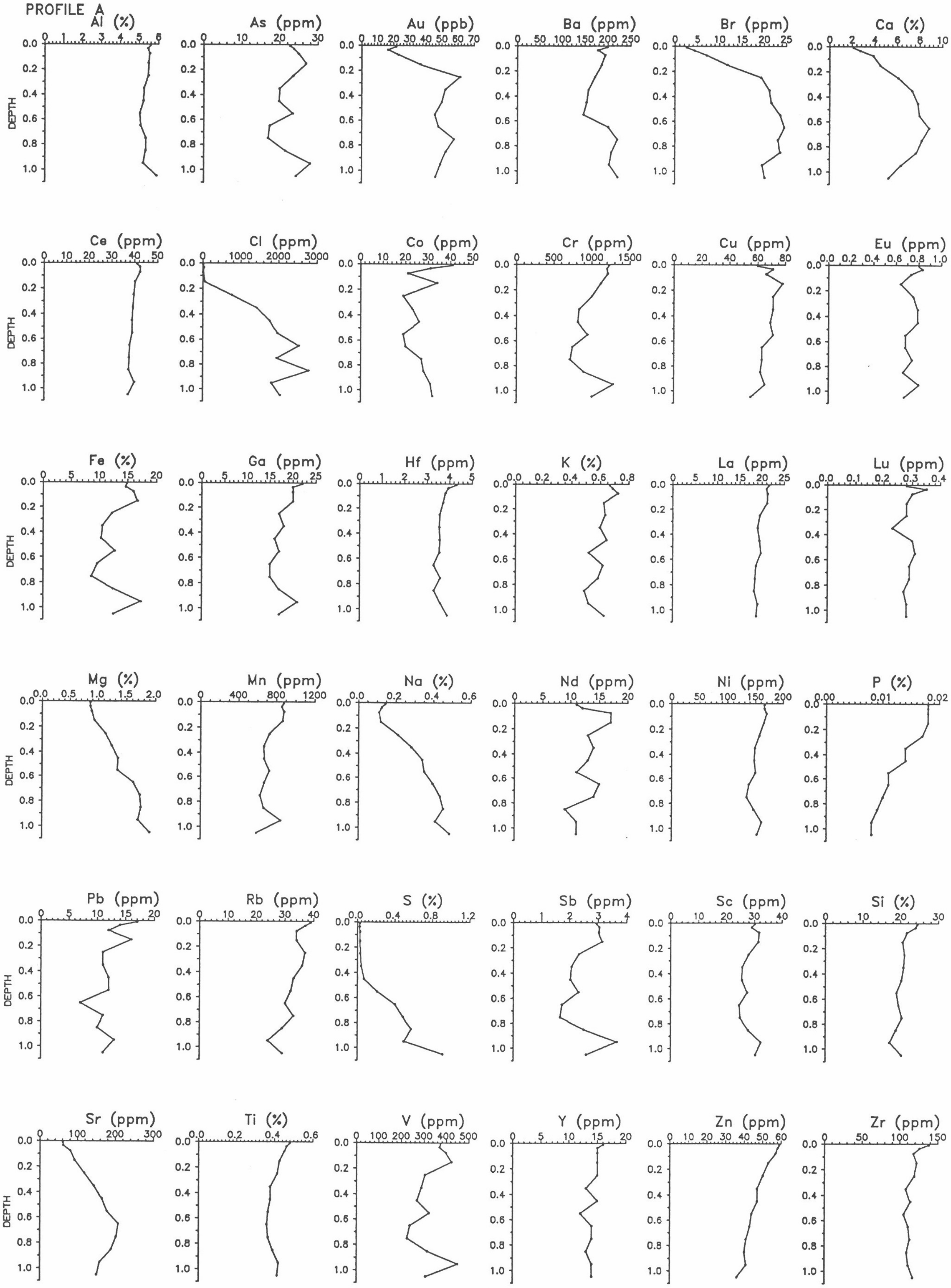
NUMBER	PROFILE	DEPTH	Ir inaa ppb	La xrf(tr) ppm	Lu inaa ppm	Mo xrf(tr) ppm	Nb xrf(tr) ppm	Nd xrf(tr) ppm	Ni xrf(tr) ppm	Pb xrf(tr) ppm	Rb xrf(tr) ppm	Sb xrf(tr) ppm	Sc xrf(tr) ppm	Se xrf(tr) ppm	Sm inaa ppm	Sr xrf(tr) ppm	Ta inaa ppm	Th inaa ppm	U inaa ppm
04-4460	H	0.025	-	22	-	-	3	-	119	11	26	-	20	-	-	29	-	-	-
04-4462	H	0.150	-	30	-	-	5	-	189	16	47	-	31	-	-	44	-	-	-
04-4464	H	0.350	-	26	-	-	5	-	175	13	43	-	28	-	-	81	-	-	-
04-4466	H	0.550	-	26	-	-	9	-	177	12	45	-	27	-	-	93	-	-	-
04-4468	H	0.750	-	31	-	-	6	-	191	12	50	-	28	-	-	84	-	-	-
04-4470	H	0.950	-	29	-	-	6	-	194	15	48	-	27	-	-	73	-	-	-
04-4472	H	1.250	-	26	-	-	4	-	187	12	41	-	26	-	-	79	-	-	-
04-4473	H	1.400	-	19	-	-	2	-	139	9	23	-	20	-	-	53	-	-	-
04-4474	H	1.600	-	50	-	-	3	-	293	7	19	-	27	-	-	92	-	-	-
04-4475	H	1.800	-	69	-	-	3	-	275	14	15	-	29	-	-	119	-	-	-
04-4476	H	2.000	-	21	-	-	6	-	121	27	4	-	45	-	-	21	-	-	-
04-4477	I	0.025	-	16	-	-	4	-	106	9	19	-	17	-	-	27	-	-	-
04-4479	I	0.15	-	24	-	-	5	-	168	13	39	-	27	-	-	45	-	-	-
04-4481	I	0.35	-	24	-	-	4	-	169	13	39	-	28	-	-	121	-	-	-
04-4483	I	0.55	-	26	-	-	2	-	171	11	38	-	27	-	-	132	-	-	-
04-4485	I	0.75	-	26	-	-	5	-	187	11	40	-	28	-	-	99	-	-	-
04-4487	I	0.95	-	26	-	-	7	-	196	15	43	-	28	-	-	86	-	-	-
04-4488	I	1.1	-	24	-	-	9	-	184	13	36	-	27	-	-	87	-	-	-
04-4489	I	1.3	-	33	-	-	5	-	166	12	16	-	35	-	-	68	-	-	-
04-4490	I	1.5	-	46	-	-	8	-	190	23	5	-	46	-	-	47	-	-	-
04-4491	I	1.7	-	43	-	-	3	-	179	21	7	-	47	-	-	42	-	-	-
04-4492	I	1.9	-	33	-	-	6	-	153	19	7	-	35	-	-	44	-	-	-
04-4493	J	0.05	-	30	-	-	5	-	184	12	39	-	28	-	-	34	-	-	-
04-4495	J	0.25	-	33	-	-	5	-	191	11	39	-	30	-	-	38	-	-	-
04-4496	J	0.35	-	31	-	-	7	-	201	12	41	-	30	-	-	43	-	-	-
04-4497	J	0.45	-	30	-	-	7	-	188	14	38	-	28	-	-	43	-	-	-
04-4499	J	0.65	-	23	-	-	5	-	154	9	30	-	26	-	-	72	-	-	-
04-4500	J	0.75	-	23	-	-	6	-	156	12	26	-	26	-	-	59	-	-	-
04-4501	J	0.85	-	49	-	-	1	-	169	20	11	-	42	-	-	25	-	-	-
04-4502	J	0.95	-	24	-	-	2	-	177	7	6	-	47	-	-	60	-	-	-
04-4503	J	1.1	-	17	-	-	4	-	201	5	4	-	46	-	-	70	-	-	-
04-4504	J	1.3	-	28	-	-	2	-	191	2	4	-	44	-	-	70	-	-	-
04-4505	J	1.5	-	21	-	-	1	-	183	5	4	-	42	-	-	145	-	-	-
04-4506	K	0.05	-	18	-	-	3	-	244	7	10	-	40	-	-	106	-	-	-
04-4508	K	0.25	-	10	-	-	4	-	190	4	5	-	42	-	-	321	-	-	-
04-4510	K	0.45	-	11	-	-	4	-	195	4	3	-	42	-	-	281	-	-	-
04-4512	K	0.65	-	14	-	-	1	-	312	1	3	-	47	-	-	239	-	-	-
04-4514	K	0.85	-	18	-	-	5	-	304	1	3	-	46	-	-	219	-	-	-
04-4516	K	1.1	-	16	-	-	2	-	384	2	2	-	53	-	-	235	-	-	-
04-4517	K	1.3	-	12	-	-	2	-	376	1	1	-	53	-	-	215	-	-	-
04-4518	K	1.5	-	13	-	-	2	-	425	3	2	-	58	-	-	179	-	-	-
04-4519	K	1.8	-	13	-	-	3	-	470	3	2	-	56	-	-	120	-	-	-

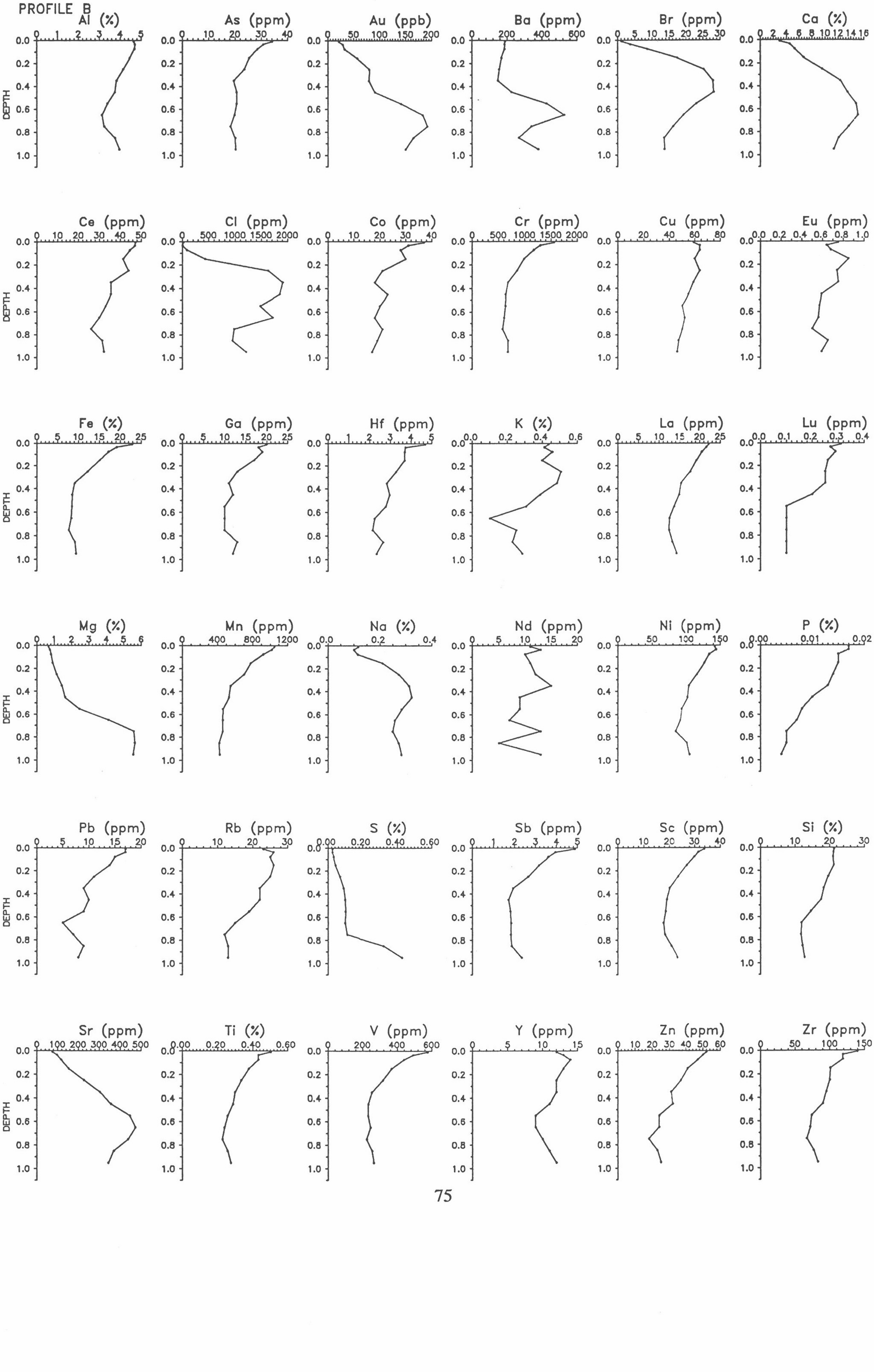
Profile chemical data (continued)

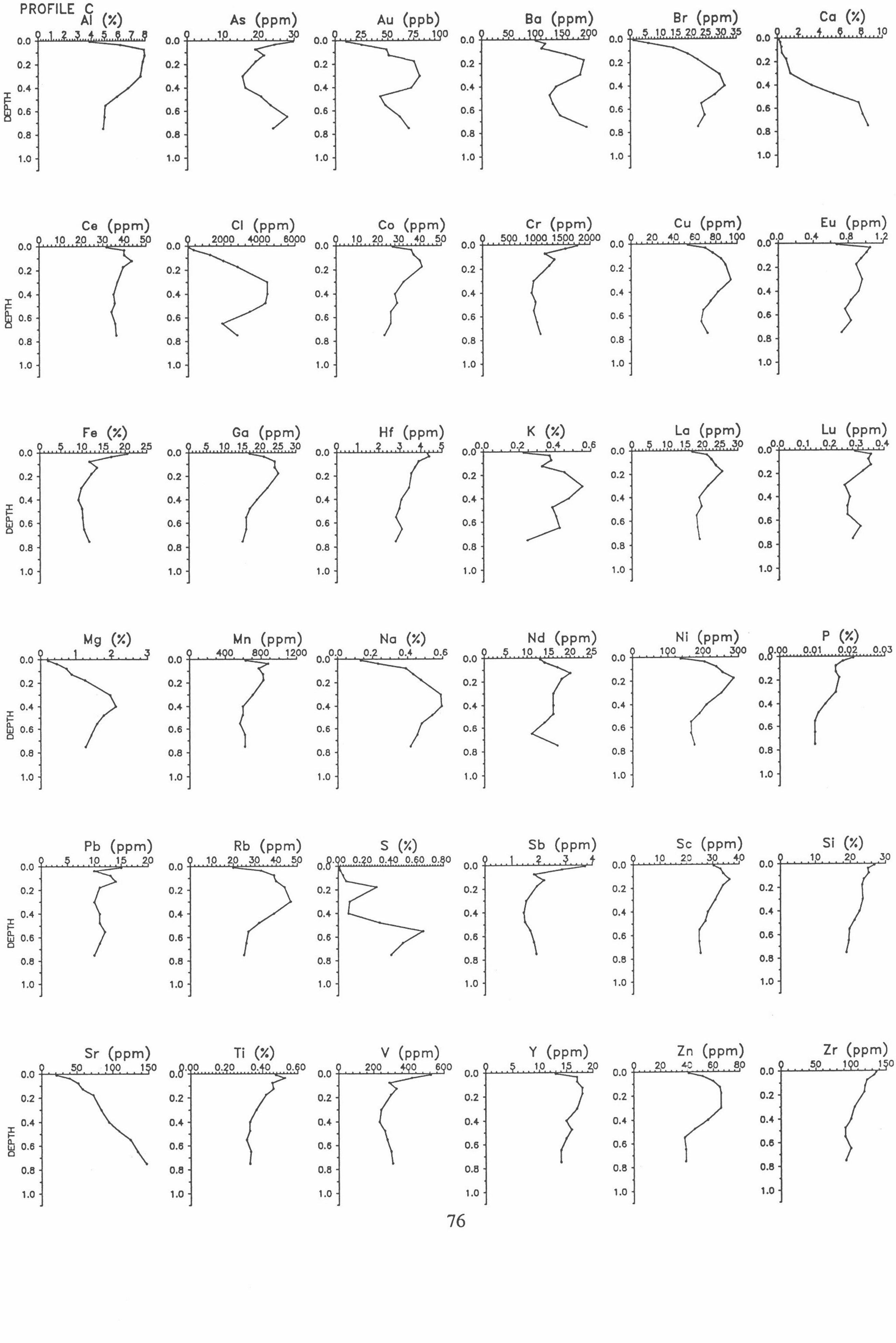
NUMBER	PROFILE	DEPTH	V xrf(tr) ppm	W xrf(tr) ppm	Y xrf(tr) ppm	Yb inaa ppm	Zn xrf(tr) ppm	Zr xrf(tr) ppm
4353	A	0.001	373	2	16	1.71	59	138
4354	A	0.003	369	3	15	1.60	58	126
4355	A	0.008	398	<1	15	1.66	57	118
4356	A	0.015	424	<1	15	1.69	53	122
4357	A	0.025	304	<1	15	1.62	50	119
4358	A	0.035	288	<1	13	1.48	47	108
4359	A	0.045	268	<1	15	1.50	47	114
4360	A	0.055	323	<1	12	1.56	44	105
4361	A	0.065	237	<1	14	1.53	43	111
4362	A	0.075	225	<1	14	1.55	41	113
4363	A	0.085	314	<1	13	1.57	40	109
4364	A	0.095	451	4	14	1.57	41	111
4365	A	1.05	308	1	14	1.65	36	117
4379	B	0.001	577	<1	12	1.83	52	140
4380	B	0.003	493	<1	13	1.58	50	119
4381	B	0.008	439	1	14	1.55	47	119
4382	B	0.015	367	<1	13	1.54	41	101
4383	B	0.025	317	<1	12	1.39	37	100
4384	B	0.035	254	<1	12	1.32	31	95
4385	B	0.045	233	<1	11	1.26	32	90
4386	B	0.055	232	<1	9	1.23	24	74
4387	B	0.065	246	<1	9	1.08	24	72
4388	B	0.075	224	<1	10	1.04	18	67
4389	B	0.085	255	1	11	1.12	23	77
4390	B	0.095	265	<1	12	1.12	25	83
4281	C	0.001	526	<1	13	1.76	41	136
4282	C	0.003	419	3	17	1.89	52	133
4283	C	0.008	289	1	17	1.88	60	123
4284	C	0.013	331	<1	18	1.80	65	120
4285	C	0.02	298	1	18	1.83	66	119
4286	C	0.03	243	<1	17	1.69	66	105
4287	C	0.04	234	<1	15	1.65	56	100
4288	C	0.048	264	<1	16	1.57	46	92
4289	C	0.055	277	<1	15	1.51	38	92
4290	C	0.065	299	1	14	1.50	39	100
4291	C	0.075	308	1	14	1.62	39	93
04-4411	E	0.05	267	-	14	-	61	88
04-4413	E	0.25	221	-	13	-	49	79
04-4415	E	0.45	218	-	13	-	42	75
04-4417	E	0.65	221	-	18	-	42	84
04-4419	E	0.85	212	-	22	-	44	95
04-4421	E	1.1	220	-	29	-	35	81
04-4422	E	1.3	227	-	4	-	30	71
04-4425	E	1.9	307	-	1	-	21	49
04-4426	F	0.05	328	-	11	-	53	116
04-4428	F	0.25	529	-	10	-	32	79
04-4430	F	0.45	321	-	7	-	18	57
04-4432	F	0.65	339	-	6	-	18	53
04-4434	F	0.85	585	-	7	-	11	57
04-4436	F	1.1	367	-	7	-	11	67
04-4438	F	1.5	326	-	10	-	12	90
04-4440	F	1.9	680	-	6	-	9	72
04-4442	G	0.05	358	-	12	-	43	118
04-4443	G	0.15	377	-	15	-	50	113
04-4444	G	0.25	323	-	15	-	58	105
04-4445	G	0.35	231	-	18	-	59	111
04-4446	G	0.45	773	-	19	-	40	110
04-4447	G	0.55	817	-	18	-	38	94
04-4448	G	0.65	821	-	17	-	37	101
04-4449	G	0.75	822	-	17	-	34	102
04-4450	G	0.85	818	-	17	-	34	94
04-4451	G	0.95	498	-	16	-	34	81
04-4452	G	1.05	585	-	23	-	32	88
04-4453	G	1.15	1068	-	35	-	48	114
04-4454	G	1.25	940	-	26	-	36	112
04-4455	G	1.35	580	-	30	-	43	118
04-4456	G	1.45	210	-	20	-	39	106
04-4457	G	1.55	865	-	34	-	43	107
04-4458	G	1.65	1047	-	13	-	38	119
04-4459	G	1.75	1328	-	6	-	29	129

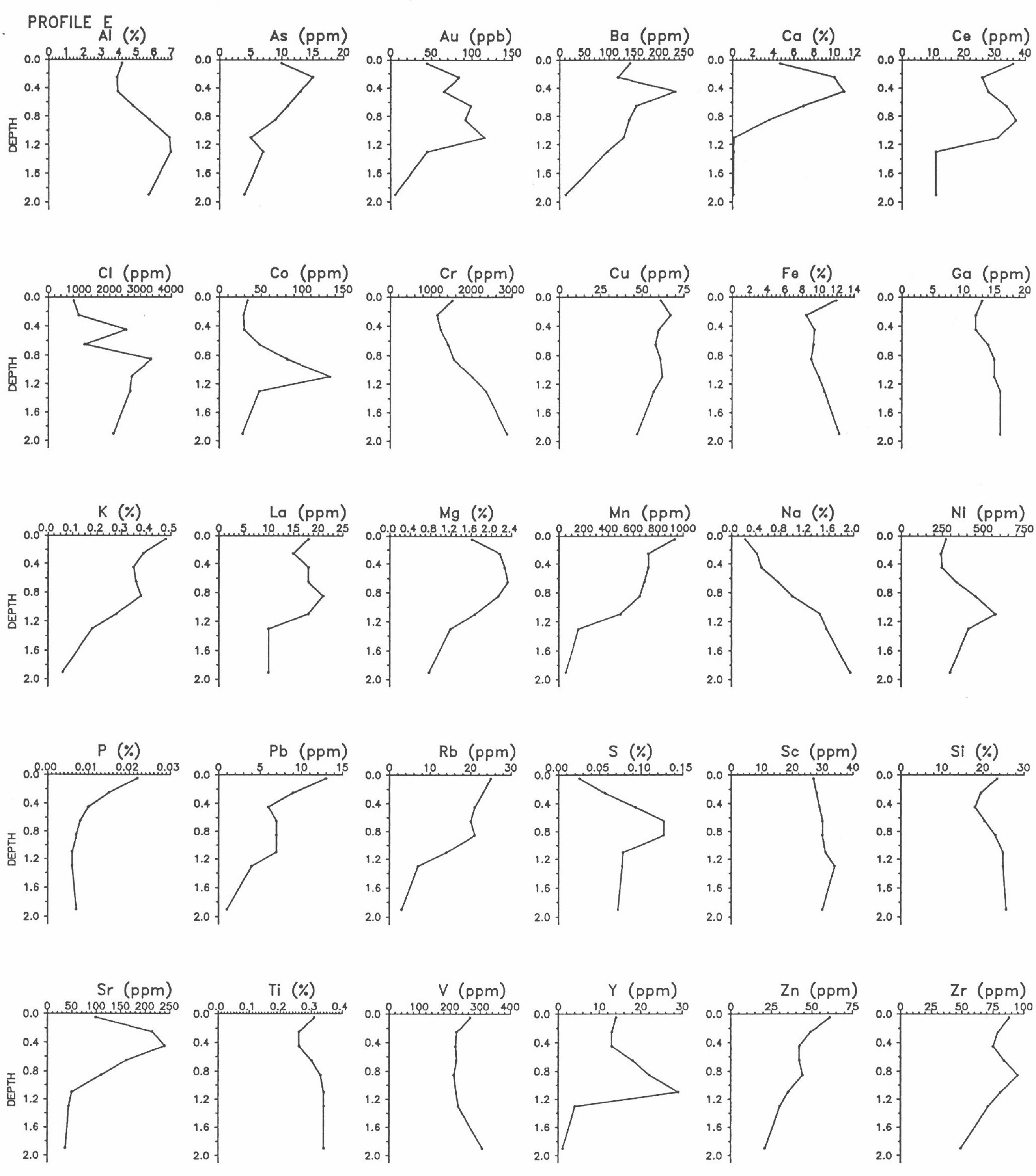
Profile chemical data (continued)

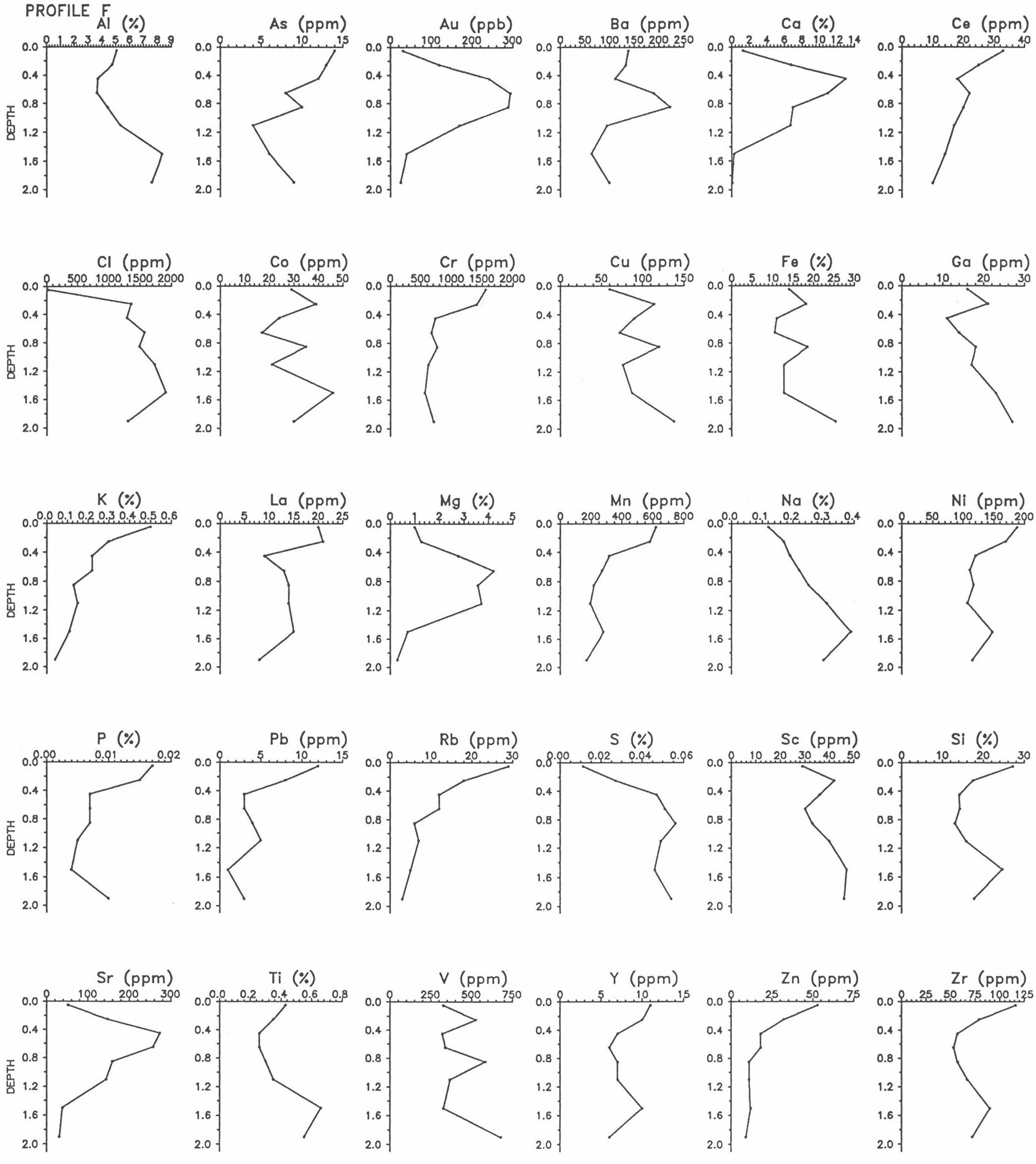
NUMBER	PROFILE	DEPTH	V xrf(tr) ppm	W xrf(tr) ppm	Y xrf(tr) ppm	Yb inaa ppm	Zn xrf(tr) ppm	Zr xrf(tr) ppm
04-4460	H	0.025	283	-	13	-	48	128
04-4462	H	0.150	234	-	16	-	81	138
04-4464	H	0.350	223	-	17	-	72	130
04-4466	H	0.550	203	-	17	-	70	143
04-4468	H	0.750	205	-	20	-	74	148
04-4470	H	0.950	209	-	20	-	76	150
04-4472	H	1.250	190	-	18	-	67	128
04-4473	H	1.400	201	-	14	-	43	94
04-4474	H	1.600	248	-	35	-	38	101
04-4475	H	1.800	284	-	45	-	34	100
04-4476	H	2.000	1273	-	6	-	36	122
04-4477	I	0.025	342	-	10	-	45	127
04-4479	I	0.15	251	-	16	-	70	122
04-4481	I	0.35	234	-	16	-	67	114
04-4483	I	0.55	223	-	17	-	65	120
04-4485	I	0.75	216	-	20	-	66	129
04-4487	I	0.95	219	-	19	-	70	137
04-4488	I	1.1	205	-	19	-	64	134
04-4489	I	1.3	639	-	18	-	45	103
04-4490	I	1.5	1116	-	22	-	42	107
04-4491	I	1.7	1247	-	18	-	39	119
04-4492	I	1.9	852	-	15	-	29	101
04-4493	J	0.05	320	-	17	-	73	122
04-4495	J	0.25	310	-	18	-	74	115
04-4496	J	0.35	243	-	17	-	77	111
04-4497	J	0.45	242	-	19	-	72	113
04-4499	J	0.65	211	-	17	-	56	99
04-4500	J	0.75	261	-	14	-	51	89
04-4501	J	0.85	997	-	21	-	49	113
04-4502	J	0.95	661	-	14	-	24	82
04-4503	J	1.1	369	-	8	-	14	51
04-4504	J	1.3	513	-	12	-	14	66
04-4505	J	1.5	342	-	14	-	15	46
04-4506	K	0.05	466	-	9	-	25	74
04-4508	K	0.25	245	-	8	-	9	39
04-4510	K	0.45	245	-	7	-	6	35
04-4512	K	0.65	402	-	6	-	6	47
04-4514	K	0.85	477	-	9	-	12	67
04-4516	K	1.1	512	-	12	-	7	50
04-4517	K	1.3	519	-	11	-	9	61
04-4518	K	1.5	525	-	8	-	7	55
04-4519	K	1.8	495	-	11	-	8	56

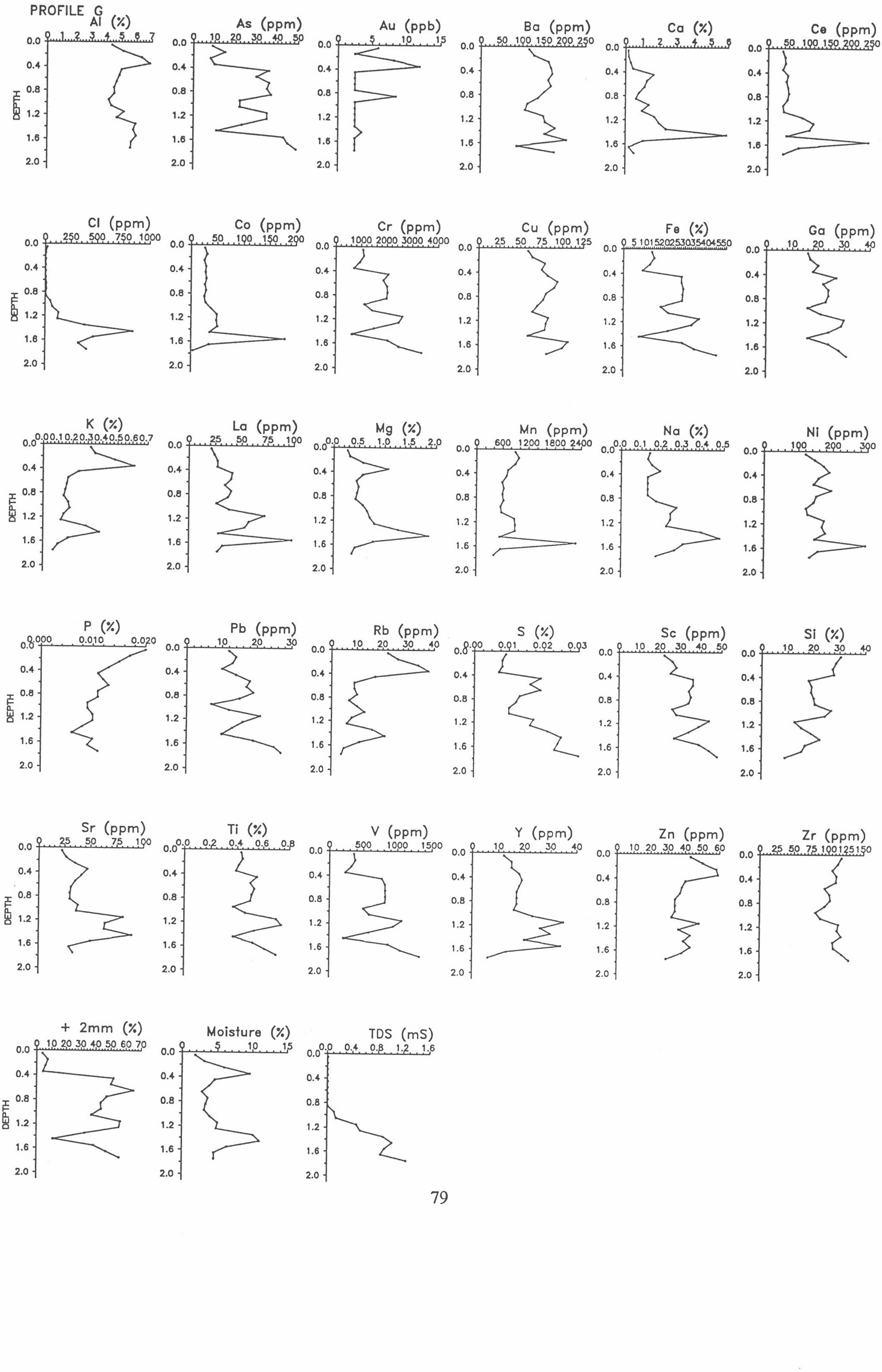

PROFILE A
Al (%)
As (ppm)
Au (ppb)
Ba (ppm)
Br (ppm)
Ca (%)
Ce (ppm)
Cl (ppm)
Co (ppm)
Cr (ppm)
Cu (ppm)
Eu (ppm)
Fe (%)
Ga (ppm)
Hf (ppm)
K (%)
La (ppm)
Lu (ppm)
Mg (%)
Mn (ppm)
Na (%)
Nd (ppm)
Ni (ppm)
P (%)
Pb (ppm)
Rb (ppm)
S (%)
Sb (ppm)
Sc (ppm)
Si (%)
Sr (ppm)
Ti (%)
V (ppm)
Y (ppm)
Zn (ppm)
Zr (ppm)
DEPTH


PROFILE B
Al (%)
As (ppm)
Au (ppb)
Ba (ppm)
Br (ppm)
Ca (%)
Ce (ppm)
Cl (ppm)
Co (ppm)
Cr (ppm)
Cu (ppm)
Eu (ppm)
Fe (%)
Ga (ppm)
Hf (ppm)
K (%)
La (ppm)
Lu (ppm)
Mg (%)
Mn (ppm)
Na (%)
Nd (ppm)
Ni (ppm)
P (%)
Pb (ppm)
Rb (ppm)
S (%)
Sb (ppm)
Sc (ppm)
Si (%)
Sr (ppm)
Ti (%)
V (ppm)
Y (ppm)
Zn (ppm)
Zr (ppm)
DEPTH

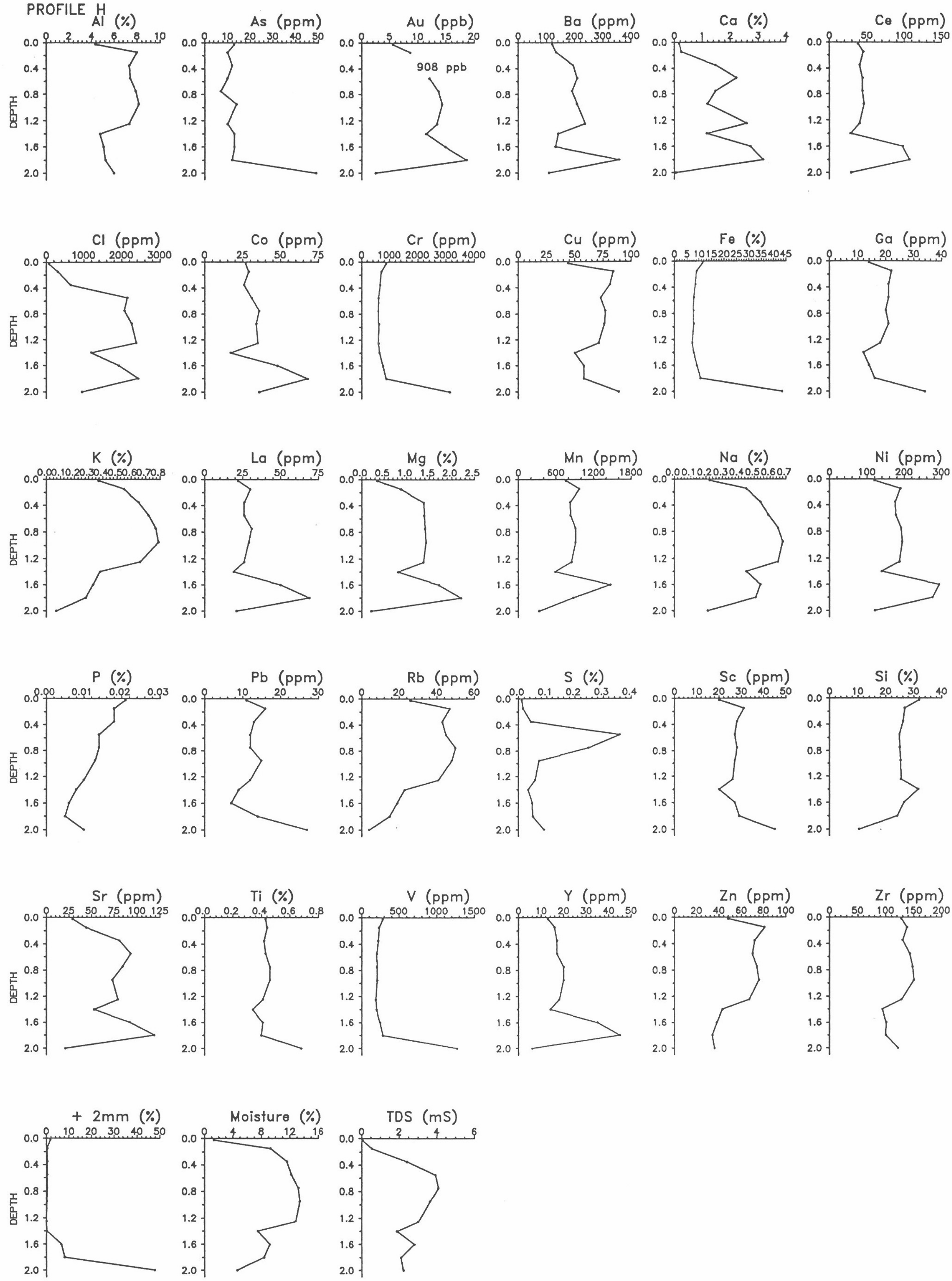

PROFILE C
Al (%)
As (ppm)
Au (ppb)
Ba (ppm)
Br (ppm)
Ca (%)
Ce (ppm)
Cl (ppm)
Co (ppm)
Cr (ppm)
Cu (ppm)
Eu (ppm)
Fe (%)
Ga (ppm)
Hf (ppm)
K (%)
La (ppm)
Lu (ppm)
Mg (%)
Mn (ppm)
Na (%)
Nd (ppm)
Ni (ppm)
P (%)
Pb (ppm)
Rb (ppm)
S (%)
Sb (ppm)
Sc (ppm)
Si (%)
Sr (ppm)
Ti (%)
V (ppm)
Y (ppm)
Zn (ppm)
Zr (ppm)
DEPTH


PROFILE E
Al (%)
As (ppm)
Au (ppb)
Ba (ppm)
Ca (%)
Ce (ppm)
Cl (ppm)
Co (ppm)
Cr (ppm)
Cu (ppm)
Fe (%)
Ga (ppm)
K (%)
La (ppm)
Mg (%)
Mn (ppm)
Na (%)
Ni (ppm)
P (%)
Pb (ppm)
Rb (ppm)
S (%)
Sc (ppm)
Si (%)
Sr (ppm)
Ti (%)
V (ppm)
Y (ppm)
Zn (ppm)
Zr (ppm)
DEPTH

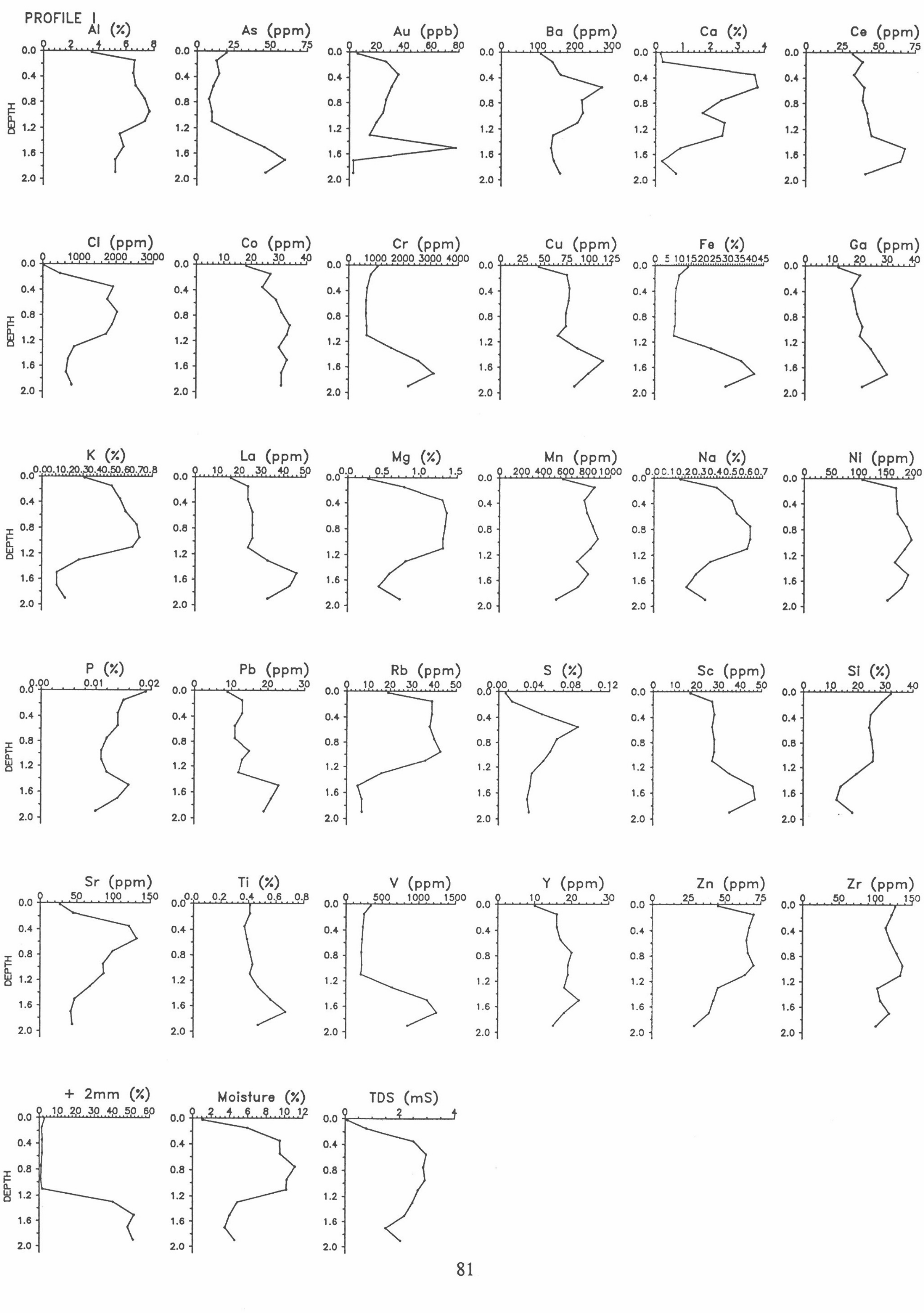

PROFILE F
Al (%)
As (ppm)
Au (ppb)
Ba (ppm)
Ca (%)
Ce (ppm)
Cl (ppm)
Co (ppm)
Cr (ppm)
Cu (ppm)
Fe (%)
Ga (ppm)
K (%)
La (ppm)
Mg (%)
Mn (ppm)
Na (%)
Ni (ppm)
P (%)
Pb (ppm)
Rb (ppm)
S (%)
Sc (ppm)
Si (%)
Sr (ppm)
Ti (%)
V (ppm)
Y (ppm)
Zn (ppm)
Zr (ppm)
DEPTH

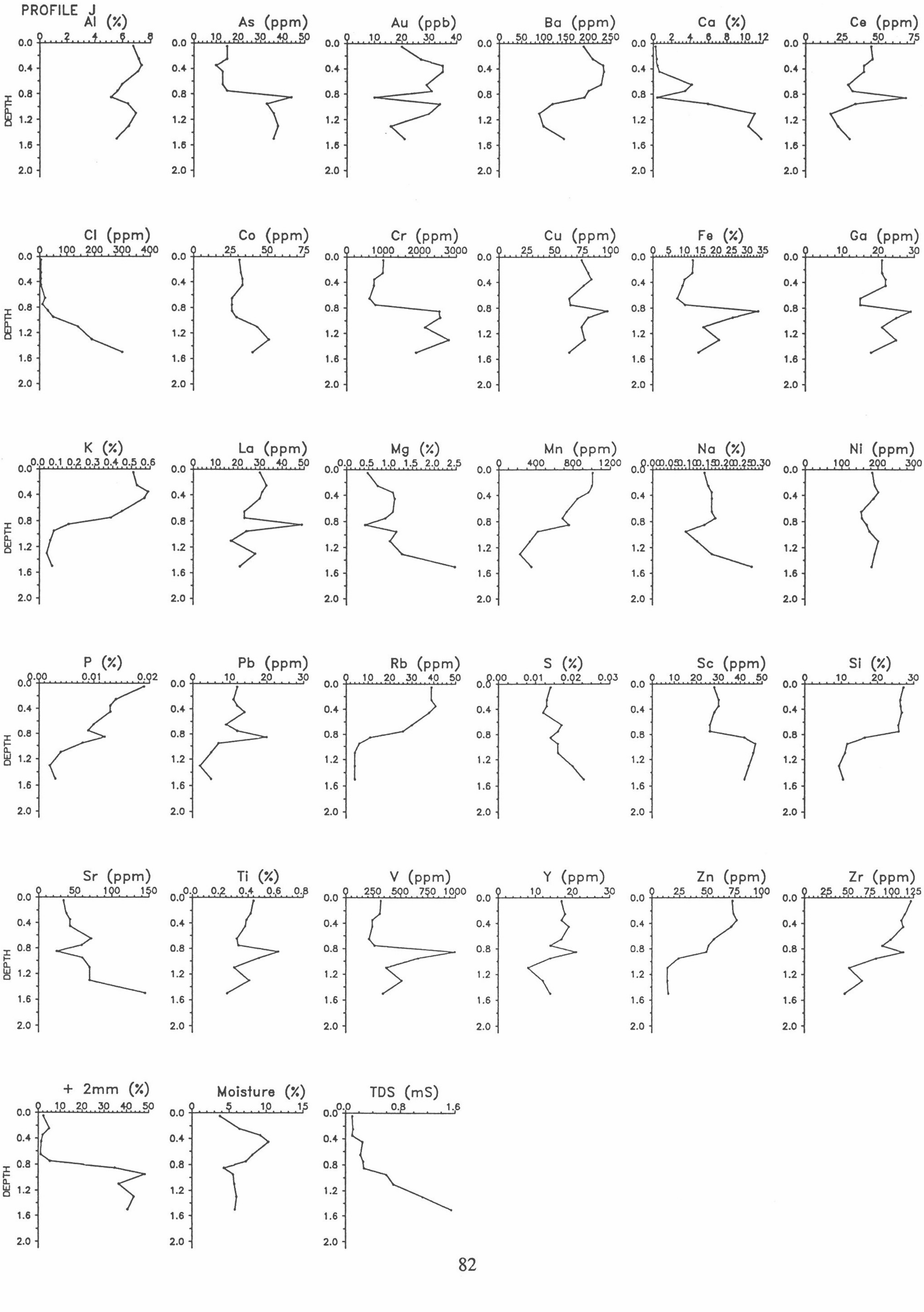

PROFILE G
Al (%)
As (ppm)
Au (ppb)
Ba (ppm)
Ca (%)
Ce (ppm)
Cl (ppm)
Co (ppm)
Cr (ppm)
Cu (ppm)
Fe (%)
Ga (ppm)
K (%)
La (ppm)
Mg (%)
Mn (ppm)
Na (%)
Ni (ppm)
P (%)
Pb (ppm)
Rb (ppm)
S (%)
Sc (ppm)
Si (%)
Sr (ppm)
Ti (%)
V (ppm)
Y (ppm)
Zn (ppm)
Zr (ppm)
+ 2mm (%)
Moisture (%)
TDS (mS)
DEPTH

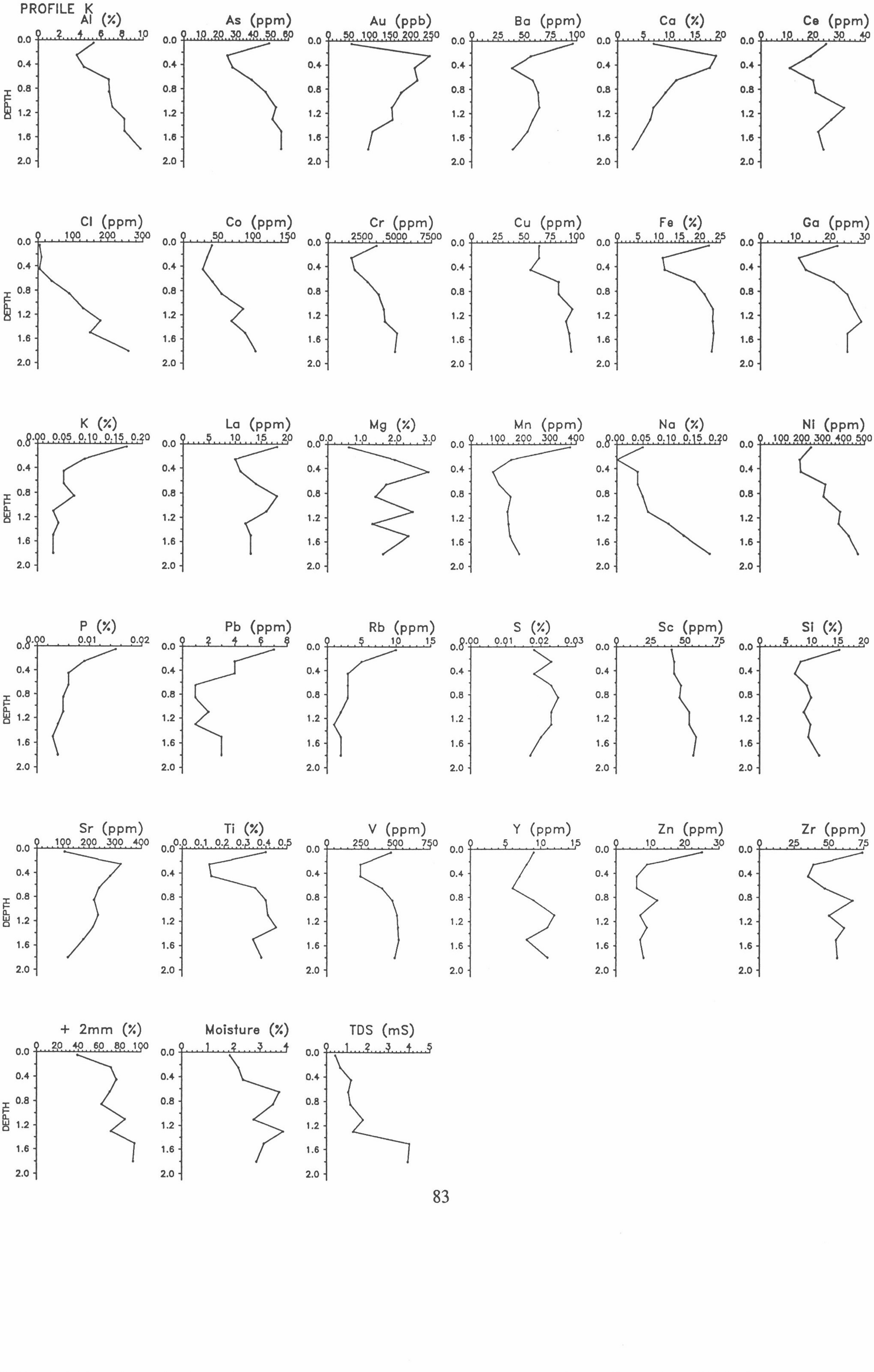
PROFILE H



Al (%)
As (ppm)
Au (ppb)
908 ppb
Ba (ppm)
Ca (%)
Ce (ppm)
Cl (ppm)
Co (ppm)
Cr (ppm)
Cu (ppm)
Fe (%)
Ga (ppm)
K (%)
La (ppm)
Mg (%)
Mn (ppm)
Na (%)
Ni (ppm)
P (%)
Pb (ppm)
Rb (ppm)
S (%)
Sc (ppm)
Si (%)
Sr (ppm)
Ti (%)
V (ppm)
Y (ppm)
Zn (ppm)
Zr (ppm)
+ 2mm (%)
Moisture (%)
TDS (mS)
DEPTH
0.0
0.4
0.8
1.2
1.6
2.0


PROFILE I
Al (%)
As (ppm)
Au (ppb)
Ba (ppm)
Ca (%)
Ce (ppm)
Cl (ppm)
Co (ppm)
Cr (ppm)
Cu (ppm)
Fe (%)
Ga (ppm)
K (%)
La (ppm)
Mg (%)
Mn (ppm)
Na (%)
Ni (ppm)
P (%)
Pb (ppm)
Rb (ppm)
S (%)
Sc (ppm)
Si (%)
Sr (ppm)
Ti (%)
V (ppm)
Y (ppm)
Zn (ppm)
Zr (ppm)
+ 2mm (%)
Moisture (%)
TDS (mS)
DEPTH


PROFILE J
Al (%)
As (ppm)
Au (ppb)
Ba (ppm)
Ca (%)
Ce (ppm)
Cl (ppm)
Co (ppm)
Cr (ppm)
Cu (ppm)
Fe (%)
Ga (ppm)
K (%)
La (ppm)
Mg (%)
Mn (ppm)
Na (%)
Ni (ppm)
P (%)
Pb (ppm)
Rb (ppm)
S (%)
Sc (ppm)
Si (%)
Sr (ppm)
Ti (%)
V (ppm)
Y (ppm)
Zn (ppm)
Zr (ppm)
+ 2mm (%)
Moisture (%)
TDS (mS)
DEPTH


PROFILE K
Al (%)
As (ppm)
Au (ppb)
Ba (ppm)
Ca (%)
Ce (ppm)
Cl (ppm)
Co (ppm)
Cr (ppm)
Cu (ppm)
Fe (%)
Ga (ppm)
K (%)
La (ppm)
Mg (%)
Mn (ppm)
Na (%)
Ni (ppm)
P (%)
Pb (ppm)
Rb (ppm)
S (%)
Sc (ppm)
Si (%)
Sr (ppm)
Ti (%)
V (ppm)
Y (ppm)
Zn (ppm)
Zr (ppm)
+ 2mm (%)
Moisture (%)
TDS (mS)
DEPTH

Vegetation chemical data for 4705N

No.	E	TYPE	Al	As	Au	Br	Ca	Ce	Cl	Co	Cr	Cs	Cu	Fe	Hf	K	La	Mg	Mn	Na	Ni	P
			xrf	inaa	inaa	inaa	xrf	inaa	xrf	inaa	xrf	inaa	xrf	xrf	inaa	xrf	inaa	xrf	xrf	xrf	xrf	xrf
			%	ppm	ppb	ppm	%	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	%	ppm	%	ppm	%
04-4269	2210	MULL	0.52	0.96	2.8	-	1.11	-	0.08	-	34	-	9	2186	-	0.16	-	0.23	188	0.11	11	0.03
04-4268	2285	MULL	0.30	0.58	<0.5	5.95	1.00	2.19	0.05	2.69	20	<0.1	6	1098	<0.1	0.10	0.97	0.20	198	0.11	6	0.01
04-4267	2325	MULL	0.94	2.32	2.5	-	1.15	-	0.10	-	71	-	10	4800	-	0.23	-	0.36	170	0.12	15	0.04
04-4266	2375	MULL	0.32	0.63	1.4	7.55	0.76	2.35	0.08	2.23	23	<0.1	7	1329	<0.1	0.12	1.2	0.23	172	0.11	9	0.02
04-4265	2425	MULL	0.29	0.64	4.0	16.2	1.11	2.9	0.07	2.31	30	<0.1	9	1454	<0.1	0.12	1.36	0.21	207	0.12	10	0.03
04-4264	2500	MULL	0.62	2.02	4.5	-	1.60	-	0.08	-	90	-	7	3855	-	0.14	-	0.22	105	0.12	13	0.03
04-4263	2550	MULL	0.31	0.62	2.9	-	1.42	-	0.06	-	29	-	4	1259	-	0.14	-	0.14	119	0.07	12	0.02
04-4262	2600	MULL	0.42	0.73	5.8	12.1	1.20	2.47	0.06	2.19	43	<0.1	5	1688	<0.1	0.15	0.95	0.24	73	0.10	10	0.02
04-4261	2650	MULL	0.85	1.95	19.2	14	2.09	4.05	0.04	3.36	107	0.28	7	4005	0.51	0.16	2	0.39	74	0.05	18	0.02
04-4260	2700	MULL	0.70	1.16	5.8	10.1	1.64	2.56	0.04	3.45	91	<0.1	9	3052	0.3	0.17	1.46	0.45	114	0.07	22	0.03

No.	E	TYPE	S	Sb	Sc	Si	Sm	Sr	Th	Ti	V	Yb	Zn
			xrf	inaa	inaa	xrf	inaa	xrf	inaa	xrf	xrf	inaa	xrf
			%	ppm	ppm	%	ppm	ppm	ppm	rat	ppm	ppm	ppm
04-4269	2210	MULL	0.09	-	-	0.97	-	68	-	129	13	-	28
04-4268	2285	MULL	0.05	<0.1	0.73	0.57	0.18	78	0.37	70	7	<0.1	17
04-4267	2325	MULL	0.10	-	-	1.81	-	66	-	242	27	-	18
04-4266	2375	MULL	0.06	<0.1	0.89	0.77	0.21	57	0.42	82	7	<0.1	15
04-4265	2425	MULL	0.10	<0.1	0.97	0.59	0.26	48	0.47	89	9	<0.1	13
04-4264	2500	MULL	0.07	-	-	1.20	-	83	-	142	20	-	11
04-4263	2550	MULL	0.09	-	-	0.53	-	104	-	77	5	-	12
04-4262	2600	MULL	0.08	<0.1	1.33	0.75	0.19	68	0.53	92	9	<0.1	10
04-4261	2650	MULL	0.10	0.16	3.05	1.55	0.39	86	1.08	221	20	0.22	9
04-4260	2700	MULL	0.10	<0.1	2.07	1.40	0.31	69	0.63	150	16	0.15	16

Elements below detection limit in ppm (Ag(1), As(1), Ba(10), Ce(1), Co(0.2), Cs(0.1) Eu(0.2), Hf(0.1), Ir(0.005), Lu(0.1), Mo(5), Rb(5), Sb(0.1), Se(1), Sm(0.05), U(0.5) and W(0.1).

No.	E	TYPE	Al	Au	Br	Ca	Cl	Cr	Cu	Fe	K	La	Mg	Mn	Na	Ni	P	S	Sc	Si	Sr	Ta
			xrf	inaa	inaa	xrf	xrf	xrf	xrf	xrf	xrf	inaa	xrf	xrf	xrf	xrf	xrf	xrf	inaa	xrf	xrf	inaa
			%	ppb	ppm	%	%	ppm	ppm	ppm	%	ppm	%	ppm	%	ppm	%	%	ppm	%	ppm	ppm
04-4229	2210	EUC	0.01	0.44	-	0.40	0.57	3	10	69	0.75	-	0.15	50	0.61	4	0.07	0.11	-	0.08	17	-
04-4228	2285	EUC	0.03	<0.07	28.5	0.58	0.69	6	7	97	1.05	<0.1	0.16	38	0.53	3	0.07	0.11	<0.05	0.17	37	0.33
04-4227	2325	EUC	0.03	0.32	-	0.63	0.59	5	11	103	0.57	-	0.24	85	0.65	4	0.06	0.11	-	0.15	46	-
04-4226	2375	EUC	0.02	<0.07	23.6	0.44	0.55	2	12	106	0.69	<0.1	0.32	64	0.51	7	0.08	0.13	<0.05	0.09	33	<0.2
04-4225	2425	EUC	0.03	0.64	42.5	0.53	0.84	5	4	184	0.57	0.21	0.16	95	0.63	5	0.06	0.10	0.09	0.14	27	<0.2
04-4224	2500	EUC	0.02	<0.07	-	0.55	0.51	2	4	95	0.56	-	0.13	57	0.56	2	0.05	0.09	-	0.07	30	-
04-4223	2550	EUC	0.06	0.1	-	1.30	0.32	2	3	123	0.52	-	0.15	113	0.28	11	0.04	0.12	-	0.13	90	-
04-4222	2600	EUC	0.02	1.215	36.6	0.40	0.95	3	4	84	0.75	<0.1	0.12	28	0.74	1	0.06	0.09	<0.05	0.10	18	<0.2
04-4221	2650	EUC	0.03	<0.07	67.3	0.88	0.96	3	4	148	0.49	<0.1	0.18	44	0.47	6	0.05	0.12	0.09	0.09	58	<0.2
04-4220	2700	EUC	0.02	0.73	25.5	0.55	0.65	3	7	89	0.93	<0.1	0.10	84	0.57	5	0.06	0.12	<0.05	0.07	22	<0.2

No.	E	TYPE	Th	Ti	V	Zn
			inaa	xrf	xrf	xrf
			ppm	rat	ppm	ppm
04-4229	2210	EUC	-	5	<1	39
04-4228	2285	EUC	<0.2	9	<1	24
04-4227	2325	EUC	-	7	2	25
04-4226	2375	EUC	<0.2	8	<1	28
04-4225	2425	EUC	0.1	12	2	17
04-4224	2500	EUC	-	6	<1	18
04-4223	2550	EUC	-	8	2	15
04-4222	2600	EUC	<0.2	6	<1	14
04-4221	2650	EUC	0.1	10	<1	9
04-4220	2700	EUC	<0.2	4	2	19

No.	E	TYPE	Al	Au	Ca	Cl	Cr	Cu	Fe	K	Mg	Mn	Na	Ni	P	S	Si	Sr	Ti	V	Zn
			xrf	inaa	xrf	xrf	xrf	xrf	xrf	xrf	xrf	xrf	xrf	xrf	xrf	xrf	xrf	xrf	xrf	xrf	xrf
			%	ppb	%	%	ppm	ppm	ppm	%	%	ppm	%	ppm	%	%	%	ppm	counts	ppm	ppm
04-4250	2200	BLUE	0.16	3.00	0.64	2.00	12	8	775	1.537	0.37	80	3.08	5	0.04	0.21	0.35	31	55	4	16
04-4249	2250	BLUE	0.11	1.50	0.45	0.93	9	7	534	1.098	0.21	61	2.32	3	0.04	0.13	0.26	20	38	4	7
04-4248	2300	BLUE	0.12	2.95	0.53	0.95	<0.0	8	571	1.244	0.31	58	3.04	4	0.04	0.14	0.28	25	39	2	6
04-4247	2350	BLUE	0.11	1.86	0.39	2.18	11	8	509	1.002	0.25	88	3.28	4	0.04	0.17	0.24	15	36	4	6
04-4246	2400	BLUE	0.24	2.89	0.73	1.57	25	10	1148	1.098	0.31	115	3.57	7	0.04	0.16	0.50	27	86	5	10
04-4245	2450	BLUE	0.35	7.85	0.80	2.30	33	10	1544	0.94	0.33	81	4.01	9	0.05	0.23	0.66	20	104	9	12
04-4244	2500	BLUE	0.16	3.09	0.80	0.76	16	9	814	1.231	0.48	65	2.61	5	0.04	0.14	0.35	34	53	4	13
04-4243	2550	BLUE	0.17	2.41	0.51	1.60	18	10	894	1.116	0.35	48	4.35	6	0.04	0.19	0.37	18	59	5	9
04-4242	2600	BLUE	0.10	1.90	0.89	0.86	8	5	482	0.810	0.30	35	3.16	3	0.03	0.16	0.25	48	32	2	5
04-4241	2650	BLUE	0.11	2.11	0.72	1.75	13	8	584	1.420	0.42	27	4.66	3	0.04	0.19	0.26	26	39	2	7
04-4240	2700	BLUE	0.08	2.85	0.69	1.78	10	7	410	1.386	0.39	36	4.14	4	0.04	0.17	0.22	21	26	2	7

Vegetation chemical data for 4490N

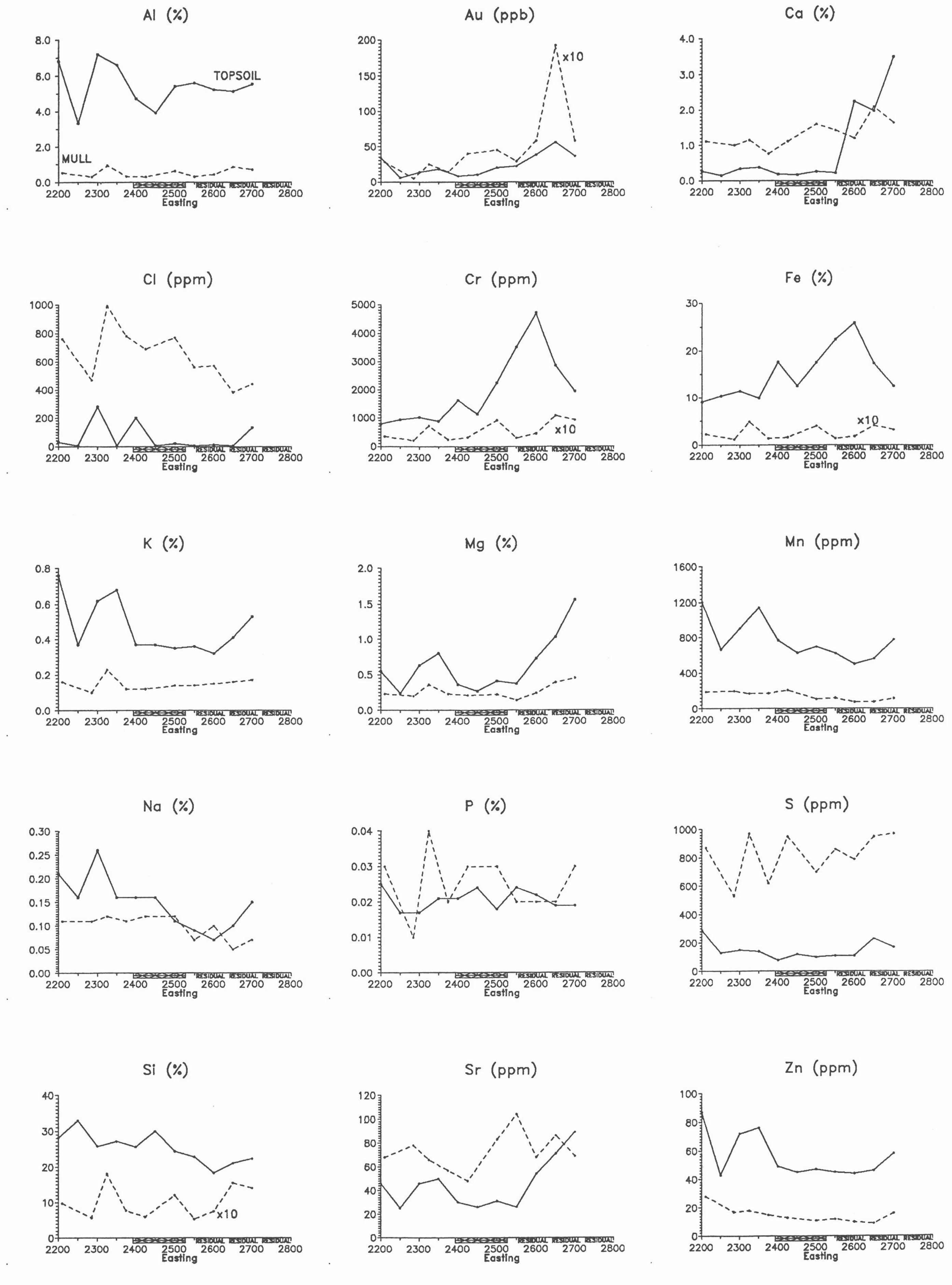
No.	E	TYPE	Al xrf %	Au inaa ppb	Ca xrf %	Cl xrf %	Cr xrf ppm	Cu xrf ppm	Fe xrf ppm	K xrf %	Mg xrf %	Mn xrf ppm	Na xrf %	Ni xrf ppm	P xrf %
04-4315	2200	EUC	0.016	<0.07	0.458	0.875	1	7	57	0.613	0.151	74	0.851	3	0.072
04-4314	2250	EUC	0.016	0.39	0.548	0.567	4	5	63	0.450	0.189	57	0.665	3	0.062
04-4313	2300	EUC	0.018	<0.07	0.524	0.722	7	7	62	0.916	0.175	36	0.499	6	0.055
04-4312	2350	EUC	0.019	<0.07	0.441	0.633	12	8	63	1.155	0.192	30	0.401	3	0.077
04-4311	2400	EUC	0.020	<0.07	0.603	0.609	9	7	84	0.729	0.166	52	0.675	5	0.062
04-4310	2450	EUC	0.023	0.39	0.564	0.847	9	5	94	0.546	0.200	524	0.521	8	0.047
04-4309	2500	EUC	0.024	0.40	0.715	0.748	8	4	94	0.536	0.150	115	0.451	5	0.036
04-4308	2550	EUC	0.025	0.41	0.745	0.826	14	4	93	0.652	0.183	42	0.398	6	0.042
04-4307	2600	EUC	0.032	0.65	0.685	0.709	14	4	122	0.571	0.224	102	0.327	4	0.064
04-4306	2650	EUC	0.026	0.38	0.561	0.779	10	6	93	0.523	0.148	126	0.537	4	0.050
04-4305	2700	EUC	0.020	0.30	0.506	0.581	9	6	84	0.618	0.164	37	0.625	5	0.105
04-4304	2750	EUC	0.035	0.97	1.172	1.147	19	4	133	0.538	0.213	100	0.527	5	0.042

No.	E	TYPE	S xrf %	Si xrf %	Sr xrf ppm	Ti xrf ppm	V xrf ppm	Zn xrf ppm
04-4315	2200	EUC	0.118	0.037	28	3	<1	33
04-4314	2250	EUC	0.118	0.046	32	4	<1	29
04-4313	2300	EUC	0.098	0.042	37	4	1	24
04-4312	2350	EUC	0.103	0.044	27	5	<1	29
04-4311	2400	EUC	0.094	0.061	34	5	<1	26
04-4310	2450	EUC	0.108	0.084	36	7	<1	24
04-4309	2500	EUC	0.100	0.075	44	6	<1	7
04-4308	2550	EUC	0.100	0.076	36	7	1	7
04-4307	2600	EUC	0.117	0.081	34	8	1	7
04-4306	2650	EUC	0.106	0.075	19	6	<1	7
04-4305	2700	EUC	0.120	0.064	43	5	<1	12
04-4304	2750	EUC	0.148	0.074	46	8	1	12

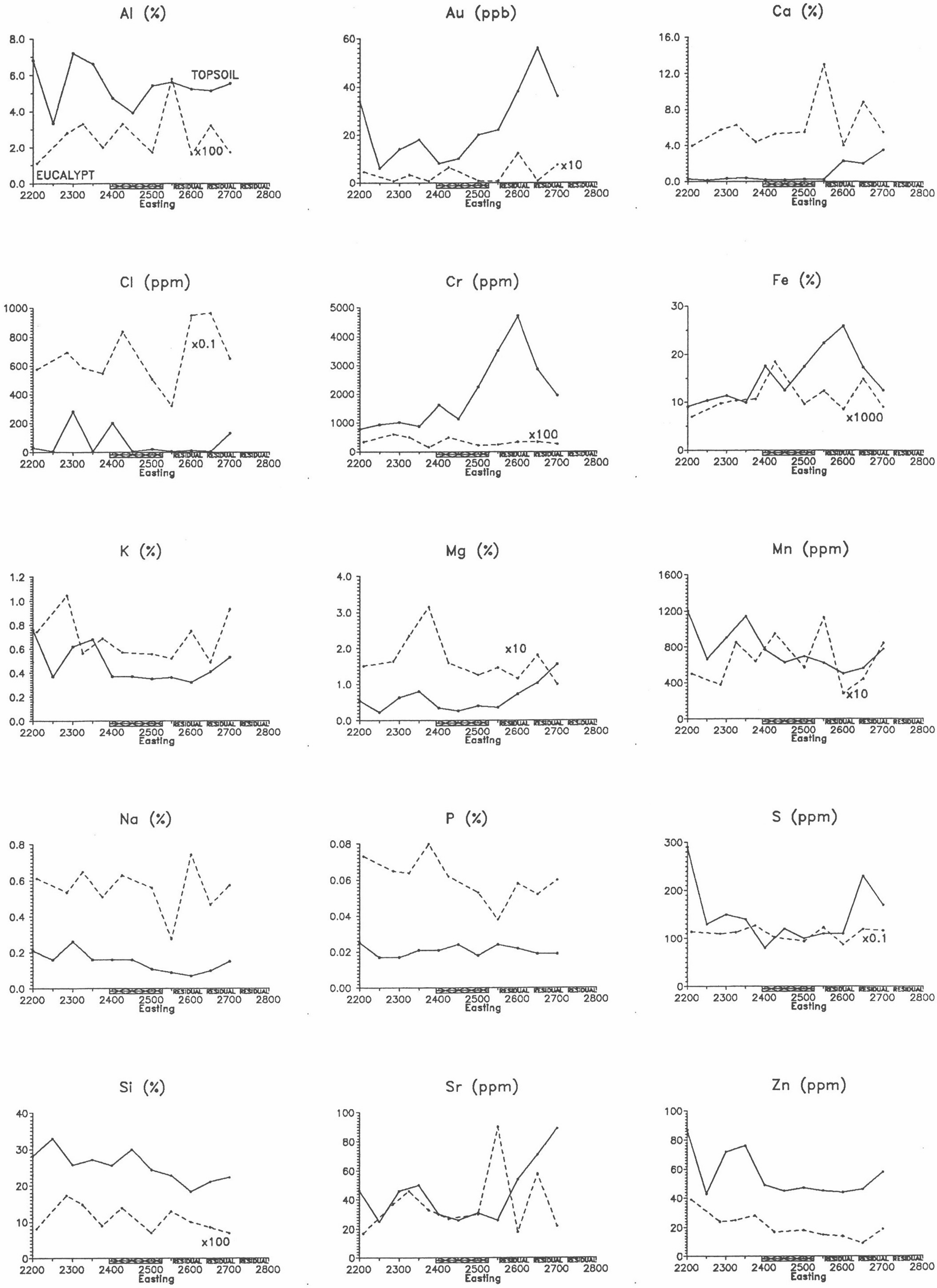
No.	E	TYPE	Al xrf %	As inaa ppm	Au inaa ppb	Ca xrf %	Cl xrf %	Cr xrf ppm	Cu xrf ppm	Fe xrf ppm	K xrf %	Mg xrf %	Mn xrf ppm	Na xrf %	Ni xrf ppm	P xrf %
04-4339	2200	MULL	0.362	0.71	1.50	0.988	0.028	22	6	1174	0.090	0.181	142	0.086	8	0.015
04-4338	2250	MULL	0.473	1.08	2.40	1.433	0.036	28	6	1689	0.097	0.187	136	0.069	8	0.021
04-4337	2300	MULL	0.339	1.17	5.80	1.156	0.043	17	7	1291	0.104	0.205	119	0.091	7	0.020
04-4336	2350	MULL	0.341	1.00	4.10	1.087	0.076	19	7	1326	0.144	0.227	131	0.114	8	0.027
04-4345	2400	MULL	0.547	1.23	3.60	1.379	0.059	43	9	2406	0.155	0.282	290	0.074	16	0.028
04-4334	2450	MULL	0.201	0.49	2.20	0.862	0.077	21	5	966	0.115	0.163	358	0.117	11	0.016
04-4333	2500	MULL	0.118	0.50	0.90	0.867	0.102	17	4	735	0.129	0.155	144	0.146	6	0.015
04-4332	2550	MULL	0.149	0.65	5.70	1.870	0.064	19	4	767	0.105	0.139	49	0.090	4	0.015
04-4331	2600	MULL	0.280	0.96	7.40	1.686	0.061	22	6	1270	0.106	0.204	95	0.071	6	0.018
04-4330	2650	MULL	0.424	0.84	2.90	1.553	0.630	40	5	1810	0.228	0.422	192	0.599	16	0.019
04-4329	2700	MULL	0.215	0.71	3.10	1.492	0.035	22	6	996	0.106	0.241	83	0.087	12	0.023
04-4328	2750	MULL	0.220	0.81	3.70	1.927	0.797	31	5	1270	0.362	0.569	104	0.724	10	0.022

No.	E	TYPE	S xrf %	Si xrf %	Sr xrf ppm	Ti xrf counts	V xrf ppm	Zn xrf ppm
04-4339	2200	MULL	0.066	0.619	74	77	7	22
04-4338	2250	MULL	0.072	0.813	101	115	11	19
04-4337	2300	MULL	0.071	0.563	83	90	7	19
04-4336	2350	MULL	0.073	0.572	73	94	7	20
04-4345	2400	MULL	0.082	0.978	65	154	13	24
04-4334	2450	MULL	0.076	0.451	39	55	5	10
04-4333	2500	MULL	0.087	0.267	53	35	4	5
04-4332	2550	MULL	0.081	0.310	81	40	7	5
04-4331	2600	MULL	0.084	0.538	74	81	9	6
04-4330	2650	MULL	0.082	0.834	166	97	11	8
04-4329	2700	MULL	0.088	0.495	60	50	5	10
04-4328	2750	MULL	0.127	0.524	32	59	5	13

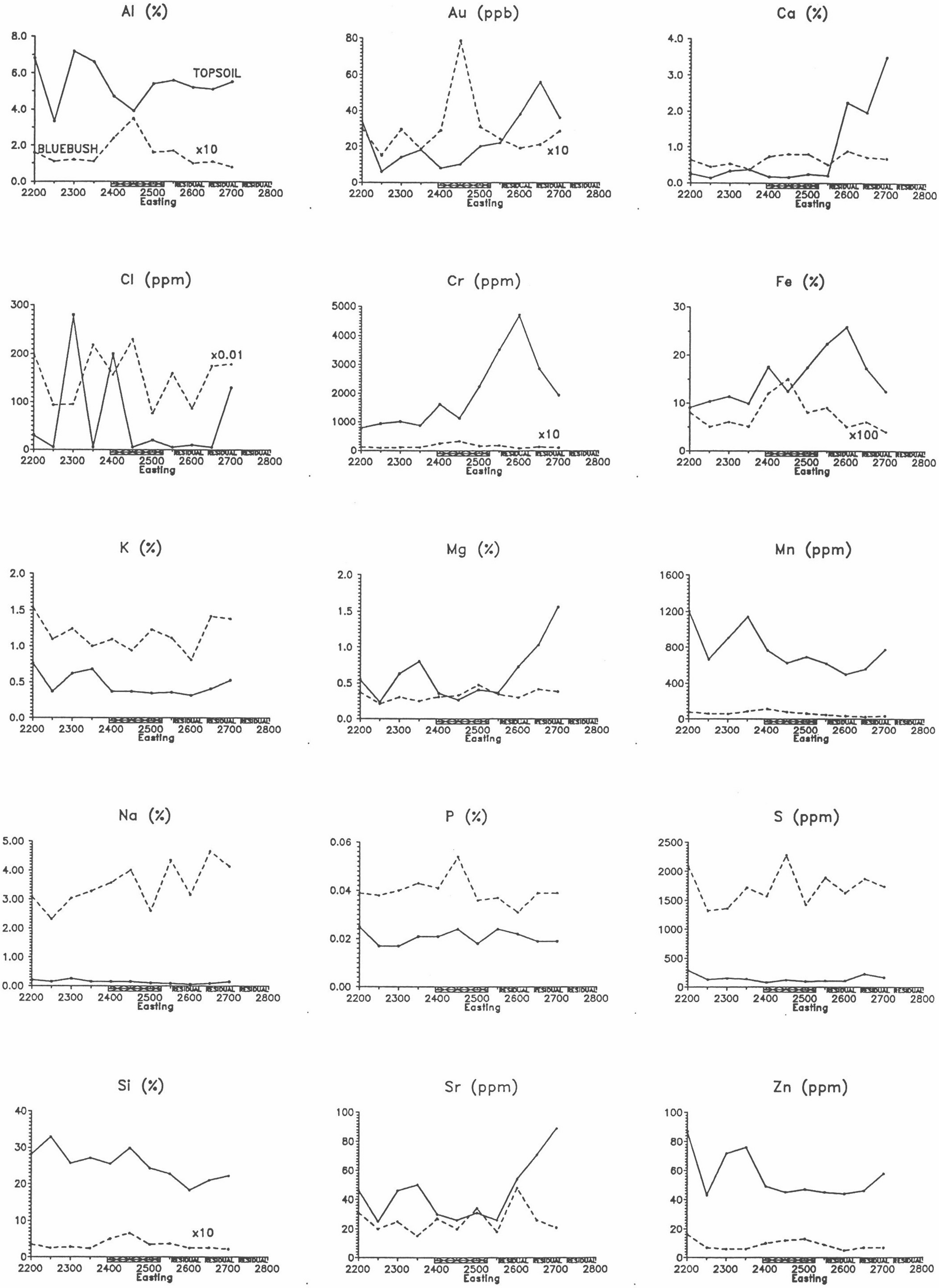
4705N MULL and TOPSOIL



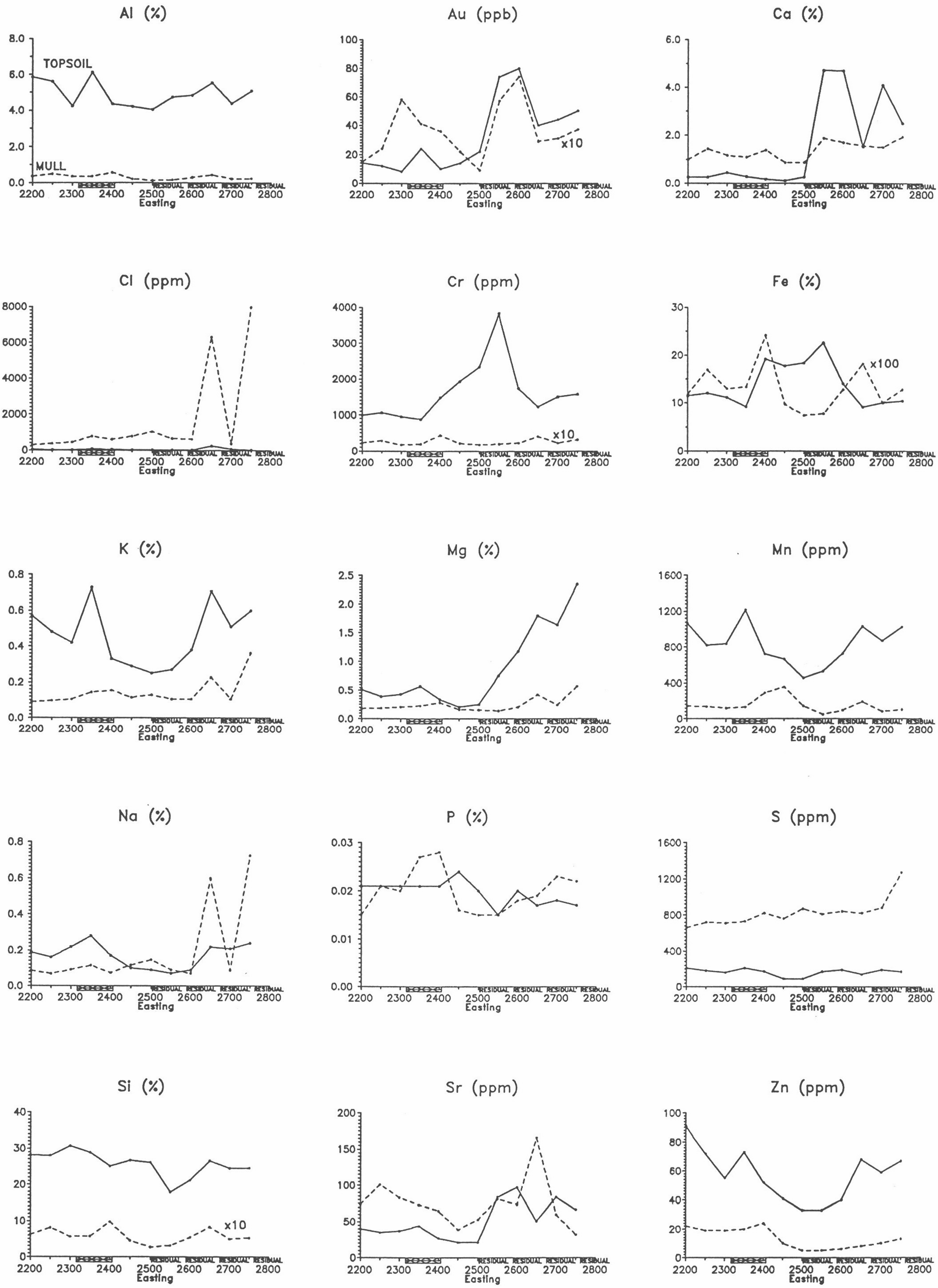
4705N EUCALYPT and TOPSOIL



4705N BLUEBUSH and TOPSOIL



4490N MULL and TOPSOIL



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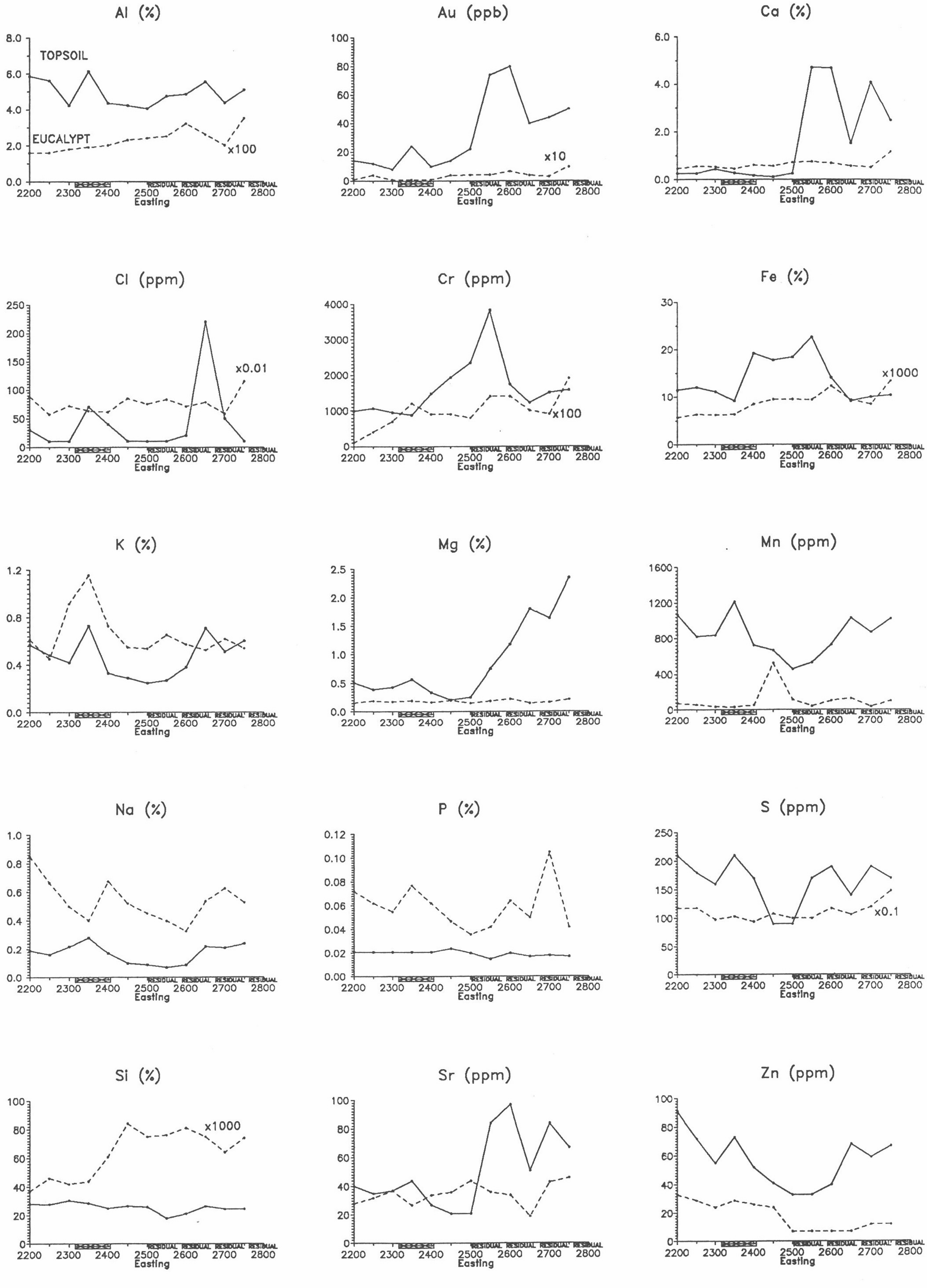

8.4 Sample Preparation and Analysis

Drill chip, soil and lag samples were riffle split, dried at about 50°C, and approximately 100 g was pulverized using a low-Cr, hardened steel ring mill to a nominal <75 μm size. Plant samples were coarsely chopped in a cross-beater mill, then finely macerated in an agate ring mill to a fine powder.

The drill chip, soil, lag and vegetation samples were analysed as follows:-

A. Neutron activation analysis on selected 30 g (approximately) aliquots (10 g for vegetation), by Becquerel Laboratories Pty. Ltd. These are designated "inaa" in the data tables.

B. X-Ray fluorescence on pressed powders of selected samples, using a Philips PW1220C instrument by the methods of Norrish and Chappell (1977) and Hart (1989), with Fe determined for matrix correction, by CSIRO. These are designated "xrf(tr)" in the data tables.

C. X-Ray fluorescence on fused discs (Li metaborate flux) of selected samples using a Philips PW1480 instrument by the method of Norrish and Hutton (1969), by CSIRO. These are designated "xrf" in the data tables.

D. X-Ray diffraction of selected samples using a Philips PW1050 diffractometer, fitted with a graphite crystal diffracted beam monochromator. CuKα radiation was used. Each sample was scanned over the range 2-65° 2θ at a speed of 1° 2θ a per minute and data were collected at 0.02° 2 θ intervals. Mineralogical compositions were determined by comparison with JCPDS files and laboratory standard traces.

E. Conductivity of selected soil samples (10 g sample and 50 mL deionised water) using a Hanna Instruments HI 8733 conductivity meter.

F. Moisture content of selected soil samples (un-crushed) by weighing before and after heating in oven for 24 hrs at 105°C.

G. Vegetation samples were analysed for Au using a wet digestion method. Approximately 100 g of macerated plant material was boiled with about 200 mL of deionised water. Then, 100 mL of H_2O_2 was added and gently heated. After most of the reaction had taken place, 50 mL of HNO_3 was added and gently heated. The digest was continued until the sample had completly bleached. The resulting digest was rinsed into a plastic container using 0.1M HCl/ 0.3M HNO_3 and made up to 1000 mL using same. The container was gently rolled for 7 days with a 1 g sachet of activated carbon. The carbon was rinsed at the end of one week, using deionised water, and analysed by INAA.