

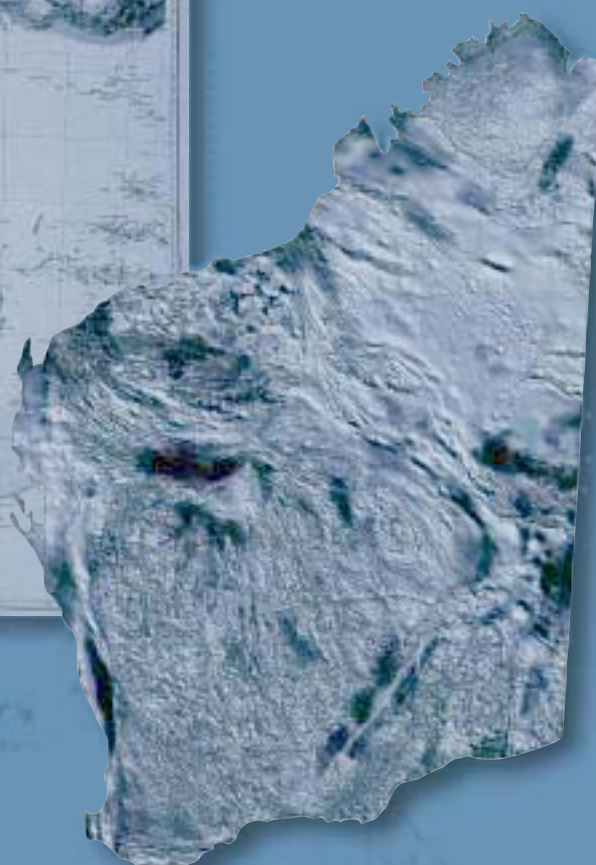
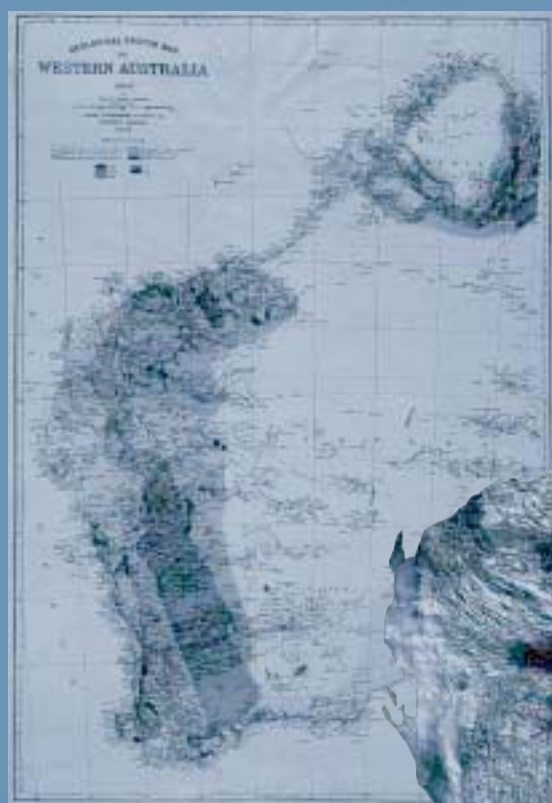


Department of
Mineral and Petroleum Resources

**RECORD
2002/14**

SELECTION CRITERIA FOR MINERAL DRILLCORE IN THE WESTERN AUSTRALIAN CORE LIBRARIES

by F. I. Roberts



Geological Survey of Western Australia



GEOLOGICAL SURVEY OF WESTERN AUSTRALIA

RECORD 2002/14

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**by
F. I. Roberts**

Perth 2002

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Selection criteria for mineral drillcore in the Western Australian core libraries

by

F. I. Roberts

Abstract

This Record describes the method used for the selection of mineral drillcore for the Western Australian core libraries. As storage within the Kalgoorlie and Perth core libraries is sufficient to store only 2 to 5% of core drilled each year in Western Australia, the selection of mineral drillcore is of critical importance for the success of the archival facilities. The libraries were constructed for the benefit of the general public, particularly the exploration industry. The ready availability of drillcore will be of significant help to industry in the formulation of exploration strategies and programs. Only drillcore perceived as valuable to the minerals and exploration industries, in the broadest sense, is archived.

Selection of core takes into consideration the need to promote the mineral prospectivity of Western Australia. Archived drillcore includes:

- core from significant mines;
- core from significant mineralization that illustrates a range of mineral commodities, styles of mineralization, and tectonic settings;
- core from a geographic spread of deposits throughout the State;
- core that may be difficult or expensive to redrill in the future;
- core that illustrates excellent examples of local stratigraphy, significant structural features or unusual geological features;
- core from prospects or areas that are popular with the mineral industry.

Criteria have been established whereby weighted selection parameters are used to determine a priority score. Using this priority score, drillcore can be ranked in order of importance with the most significant core selected for archiving.

KEYWORDS: drill core, core library, mineral, exploration, mines, mineralization, Western Australia.

Introduction

It is accepted by the mineral exploration industry in Western Australia that mineral drillcore is valuable and should be archived for future reference. The future availability of mineral drillcore will thus enhance the mineral prospectivity of Western Australia. There is a statutory requirement that all drillcore and other material generated by petroleum exploration in Western Australia be provided to, and stored by, the Geological Survey of Western Australia (GSWA) division of the Department of Mineral and Petroleum Resources (MPR). However, at the present time, there is no statutory requirement for drillcore generated by mineral exploration to be stored by GSWA, and, as a consequence, much of this valuable, and in some cases irreplaceable, material has been destroyed or lost. This has been a matter of serious concern for both industry and the Western Australian Government.

MPR policy for the storage of mineral drillcore in Western Australia

In September 1995, a draft policy was accepted by MPR (then Department of Minerals and Energy) for the storage of mineral drillcore in Western Australia (Farr, 1995). This policy was developed with input from a working group comprising industry clients, consultants, and departmental representation, and forms the basis for the policy presented in the Appendix used to determine the selection criteria outlined in this Record.

In the 1997–98 State budget the Western Australian Government announced a new initiative to support the mineral and petroleum industries in Western Australia. A critical need was specifically recognized, and funding was

provided to commence the systematic collection and curation of a representative suite of mineral exploration drillcore and other samples, and to provide facilities for industry to view this material. This will prevent future destruction of such material. It is recognized by MPR that the ready availability of drillcore material will be of significant help to industry in the formulation of robust exploration strategies and programs, thus improving the rate of discovery and development of the State's mineral resources.

The Western Australian Government initiative led to GSWA establishing a Statewide system of drillcore storage with core libraries in Kalgoorlie and Perth.

Purpose built to provide secure archives, the Western Australian core libraries will allow industry easy access to previously drilled core. This encourages research and, in turn, enhances exploration. Construction of the Kalgoorlie core library, known as the J. H. (Joe) Lord Core Library, commenced in November 1999 and the facility was officially opened in July 2000. It is located at the corner of Hunter and Broadwood Streets, West Kalgoorlie, and was named after the late Joe Lord, a former GSWA director. The Perth core library, to be constructed in 2002, is located on the corner of Harris and Briggs Streets in Carlisle. Both facilities will initially house 10 to 15 years' worth of core and have been built with provision for expansion to house a further 15 to 30 years' worth of core.

The Perth core library will be the major core archival facility housing about 70% of stored samples. This will include all petroleum, hydrological, coal, and geochemical samples, and mineral exploration materials from outside the Kalgoorlie region. Figure 1 shows the intake areas for the Kalgoorlie and Perth libraries. The Kalgoorlie core library will house about 30% of all stored samples and this will comprise chiefly diamond drillcore, the bulk of which will be generated by the mineral exploration industry in the Kalgoorlie intake area.

Criteria for selection of mineral drillcore

Only drillcore perceived as valuable, in the broadest sense, to the minerals industry is archived.

The selection criteria take into consideration GSWA's need to promote the mineral prospectivity of Western Australia. The archived material includes drillcore that:

- is from significant mines that have closed or are about to close in the near future;
- is from significant mineralization that illustrates a range of
 - (a) mineral commodities,
 - (b) styles of mineralization, or
 - (c) tectonic settings;
- illustrates a geographic spread of deposits throughout the State;
- may be difficult or expensive to redrill in the future, such as holes from urban areas, national parks, isolated and remote areas, as well as extremely deep holes;
- illustrates excellent examples of local stratigraphy, significant structural features or unusual geological features; or
- is from prospects or areas that are popular with the mineral industry. This includes core from prospects that may be subeconomic but attract a large amount of attention from prospectors and mining companies endeavouring to test new ideas and concepts. The archived drillcore may include material from prospects that are the subject of numerous joint venture proposals and thus have a large demand to view the drillcore.

Amount of material to be collected

The combined total amount of drillcore added each year to the Western Australian core libraries will be approximately 35 km. In addition to this amount, approximately 100 km of historical or heritage core from past exploration and major mining sites will be stored.

Historical drillcore

Historical or heritage drillcore is representative core from past exploration and mining. The facilities provide for a total of 35 km of historical core to be stored in Kalgoorlie and 65 km of historical core for Perth (Table 1).

Drillcore to be archived on an annual basis

Taking into consideration non-mineral exploration material that will be stored in the Perth library, the total length of drillcore to be stored each year at Kalgoorlie will be equivalent to 10 km, whereas for Perth it will be 25 km (Table 2).

Selection of mineral drillcore to be stored

As only a small percentage of core from minerals drilling can be stored each year, estimated at less than 5% of the annual diamond drilling in the State, it is necessary to determine criteria for the selection of core. To be acceptable to the exploration and mining industry, the core selection process has to be 'transparent'. An acceptable selection process thus assists in the retrieval of suitable core without conflict, and the necessity to alter the current mining act to make submission of all mineral core compulsory.

The selection process for mineral drillcore within a particular core category (Table 3) is based on determining a priority score that is calculated using a series of selection parameters (Table 4). Not all selection parameters are relevant for each core category. In addition, certain

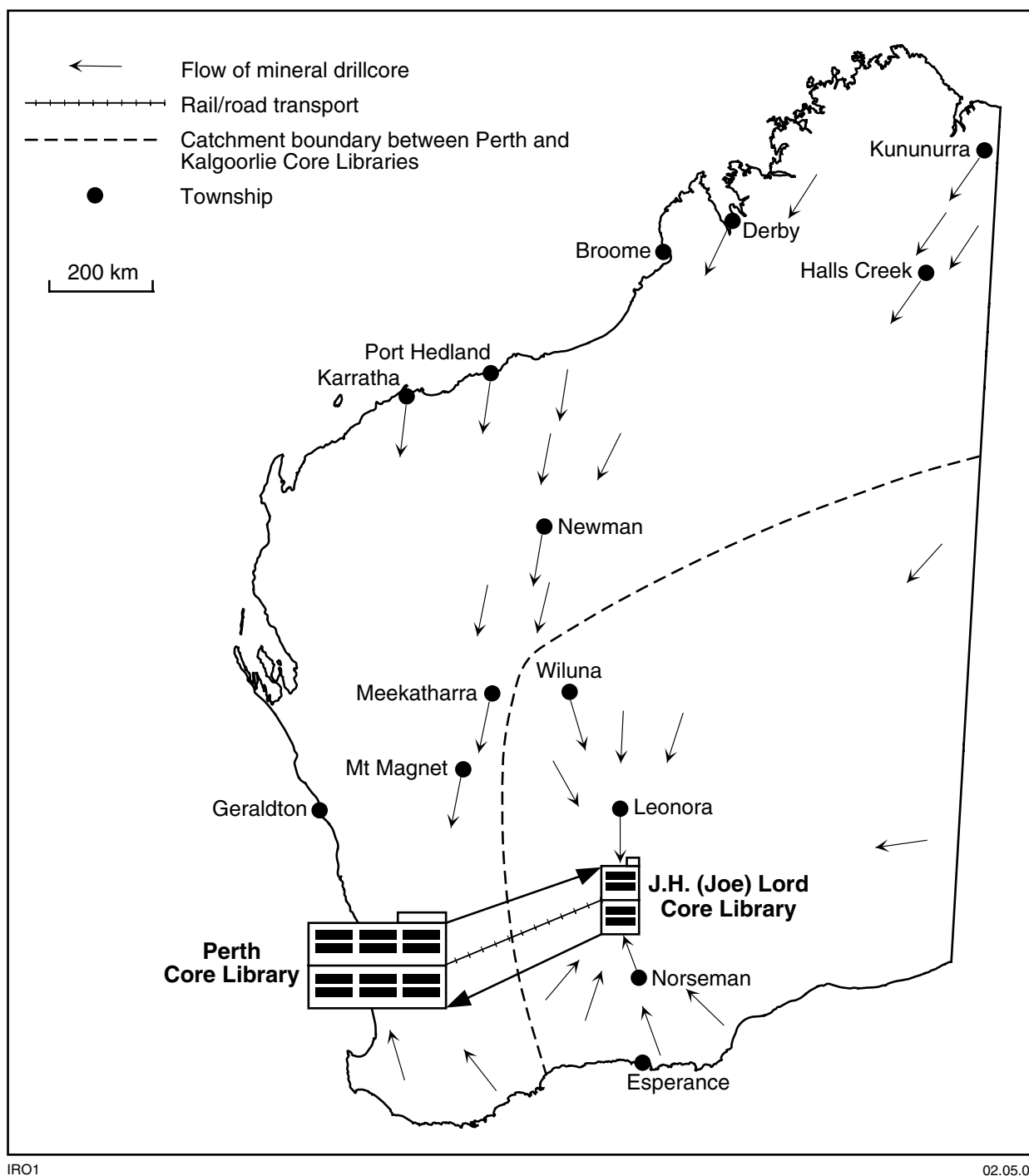


Figure 1. Catchment areas for the Kalgoorlie and Perth core libraries

selection parameters are more important in some categories than others and should therefore have a greater weighting (Table 5). The priority score for drillcore within a category is thus calculated by adding the ratings for the appropriate weighted selection parameters (Table 6).

Once drillcore has been obtained from a particular deposit or location, that deposit or location is removed from the list of priorities. Additional core from a deposit or location will only be collected if it is substantially better than the existing core.

Table 1. Historical drillcore for the Kalgoorlie and Perth core libraries

<i>Mineral drillcore</i>	<i>Percent of hole retained</i>	<i>Kalgoorlie</i>	<i>Perth</i>
Representative drillcore from past significant mining projects	100% where possible	70 holes at 500 m of core per hole (35 km of core)	130 holes at 500 m of core per hole (65 km of core)
Total		100 km of core	

Table 2. Drillcore to be archived on an annual basis for the Kalgoorlie and Perth core libraries

<i>Categories of core</i>	<i>Percent of hole stored</i>	<i>Kalgoorlie</i>	<i>Perth</i>
Representative drillcore from the most significant projects or prospects	100	7 projects per year 500 m of core/project 3.5 km of core/year	20 projects per year 500 m of core/project 10 km core/year
Intersections of significant lithological, stratigraphic, structural, geochemical, geophysical or mineralization interest	100	2 to 4 holes/year 1 km of core/year	4 to 8 holes/year 3 km of core/year
Representative drillcore from mining sites	100	assuming 1 mine/year: retain 2 holes/mine 500 m of core/hole 1 km of core/year	assuming 2 mines/year: retain 2 holes/mine 500 m of core/hole 2 km of core/year
Drillcore in areas that may be inaccessible in future (such as national parks, urban areas, and reserves)	100	assuming 1 to 2 holes/year: 500 m of core/hole 0.5 km of core/year	assuming 3 to 4 holes/year: 500 m of core/hole 2 km of core/year
Exceptionally deep drillholes (>1000 m) that are unlikely to be redrilled	100	assuming 1 hole/year: 1 km of core/year	assuming 2 holes/year: 2 km of core/year
Drillcore from remote areas difficult to access or where future access may not be possible	100	assuming 10 projects/year: 300 m of core/project 3 km of core/year	assuming 20 projects/year: 300 m of core/project 6 km of core/year
Total per year		10 km	25 km

Table 3. Selection categories for mineral drillcore**Historical or heritage drillcore**

- 1 Representative drillcore from past significant mining projects

Drillcore to be archived on an annual basis

- 2 Representative drillcore from the most significant projects or prospects
- 3 Intersections of significant lithological, stratigraphic, structural geochemical, geophysical or mineralization interest
- 4 Representative drillcore from mining sites
- 5 Drillcore from areas that may be inaccessible in the future (such as national parks, urban areas, and reserves)
- 6 Drillcore from exceptionally deep drillholes (>1000 m) that are unlikely to be redrilled
- 7 Drillcore from remote areas difficult to access or where future access may not be possible

Table 4. Selection parameters

A	Production
B	Size of mine, project or prospect
C	Style of mineralization
D	Tectonic setting
E	Type of commodity
F	Mine status
G	Geographic spread
H	Perceived significance of geological feature
I	Possibility that the drillcore may be inadequately stored, damaged or destroyed
J	Likelihood that the drillhole would not be redrilled
K	Extent of previous exploration and mining in the area
L	Amount of scientific investigation carried out on drillcore

Table 5. Weighting of selection parameters for the various categories

<i>Selection categories</i>	<i>Weighting for selection parameters</i>											
	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>H</i>	<i>I</i>	<i>J</i>	<i>K</i>	<i>L</i>
Historical core												
1	4	–	2	1	1	–	–	–	–	–	–	–
Drillcore to be archived on an annual basis												
2	–	3	2	1	1	3	2	–	–	–	–	–
3	–	–	–	–	–	–	–	4	2	1	–	–
4	–	3	2	1	1	3	2	–	–	–	–	–
5	–	–	–	–	1	–	–	2	4	–	2	1
6	–	–	–	–	1	–	–	4	2	–	–	1
7	–	3	2	1	1	3	–	4	2	1	–	1

Table 6. Rating scheme used for the various selection parameters

Rating	1	2	3	4
Production (quantity of past production)	small (e.g. <100 000 oz Au)	medium (e.g. 100 000 oz to 1 Moz Au)	large (e.g. >1 to 10 Moz Au)	giant (e.g. >10 Moz Au)
Size of mine, prospect or project	small (e.g. <100 000 oz Au)	medium (e.g. 100 000 oz to 1 Moz Au)	large (e.g. >1 to 10 Moz Au)	giant (e.g. >10 Moz Au)
Style of mineralization (taken from MINEDEX ^(a))	very common (e.g. AUSHER)	common (e.g. AUSHER, NIINTR, NILAT)	unusual (e.g. AUFVOL, AUPOR, AUGRAN)	extremely unusual
Tectonic setting	very common (e.g. Au in shear zones, Ni in komatiite unit)	common (e.g. cross faults, hinges of antiforms)	unusual (e.g. Au in alkaline rocks)	extremely unusual
Type of commodity	gold	nickel	Cu–Pb–Zn	other commodities
Mine status	prospect or long term operating mine	operating mine	mine with closure planned	mining has ceased
Geographic spread	one of a number of other similar deposits in close proximity	occurs in a cluster	isolated deposit but occurs along a known trend	isolated deposit
Perceived significance of geological feature	low	medium	high	very high
Possibility that the drillcore will be inadequately stored, damaged or destroyed	low	medium	high	very high
Likelihood that drillhole would not be redrilled	low	medium	high	very high
Extent of previous exploration and mining in the area	limited past exploration	active past exploration	active exploration area containing abandoned mines	active mining area
Amount of scientific investigation carried out on drillcore	none	basic only (e.g. only Au analysis)	large amount (e.g. multi-element analysis)	extensive

NOTES: (a) Townsend et al. (2000)
AUBIF Gold in banded iron-formation and related sedimentary rocks
AUFVOL Felsic volcanic rocks and/or volcanogenic sedimentary rocks containing auriferous quartz veins and/or shear zones
AUGRAN Gold deposits along granite–greenstone contacts and in granitoid rocks
AUPOR Gold associated with felsic porphyry within greenstones
AUSHER Basalt and/or dolerite containing auriferous quartz veins along faults or shear zones
AUSTOK Dolerite or gabbro containing auriferous quartz stockworks or veins
NILAT Lateritic nickel deposits
NIINTR Nickel in dunite phase of thick komatiite flows

Category 1 — historic drillcore: selection from known mineral deposits and areas of importance

The amount of drillcore to be archived from known mineral deposits will, to some extent, reflect the value of past production. Other aspects that should be taken into consideration include the need to archive drillcore representing a variety of mineralization styles and tectonic settings, and a diversity of commodities. For example, world-class gold and nickel deposits dominate the Kalgoorlie region, and thus a significant proportion of drillcore in the Kalgoorlie facility will be from major gold and nickel mines.

The process to acquire historical drillcore will:

1. identify known mineral deposits and areas of importance;
2. rank the importance and value in obtaining drillcore;
3. identify if diamond drillcore is available from past exploration or mining operations and its present storage location;
4. determine if it is in an acceptable condition for archival purposes (e.g. complete hole and, ideally, oriented);
5. make arrangements for the safe keeping of core until transport to the Western Australian core libraries;
6. transfer the drillcore to the appropriate core storage facility, either Kalgoorlie or Perth.

The scheme used to rank past mining operations is as follows:

$$\begin{aligned} \text{Priority score} = & \text{Rating for production} \times 4 \\ & + \\ & \text{Rating for style of mineralization} \times 2 \\ & + \\ & \text{Rating for tectonic setting} \\ & + \\ & \text{Rating for type of commodity} \end{aligned}$$

As examples, Tables 7–10 list past major mining centres and deposits (1890s to 1980s) from which representative core could be stored in the Kalgoorlie core library (note that some of these deposits are mines still in production).

Table 7. List of priorities for historical gold deposits in the Kalgoorlie region

<i>Mining centre</i>	<i>Deposit</i>	<i>Quantity of past production</i>	<i>Style of mineralization</i>	<i>Tectonic setting</i>	<i>Type of commodity</i>	<i>Priority score</i>
Boulder	Golden Mile	4	2	2	Au	23
Kalgoorlie	Mount Charlotte	3	2	2	Au	19
Wiluna	Wiluna	3	2	2	Au	19
Laverton	Lancefield	3	2	1	Au	18
Norseman	Mararoa–Crown	3	1	2	Au	17
Leonora	Sons of Gwalia	3	1	2	Au	17
Meekatharra	Paddys Flat	3	1	2	Au	17
Westonia	Edna May	2	3	2	Au	17
Kookynie	Cosmopolitan	2	3	2	Au	17
Kalgoorlie	Mount Percy	2	3	1	Au	16
Menzies	Lady Shenton – Crusoe	2	2	2	Au	15
Sandstone	Oroya Black Range	2	2	2	Au	15
New Celebration	New Celebration	2	2	2	Au	15
Kalgoorlie	Hannans North	2	2	2	Au	15
Coolgardie	Burbanks Main Reef	2	2	2	Au	15
Menzies	Princess May	2	2	2	Au	15
Coolgardie	Bayleys	2	2	2	Au	15
Mount Monger	Mount Monger	2	2	2	Au	15
Coolgardie	Three Mile Hill	2	2	2	Au	15
Karonie	Karonie	2	2	2	Au	15

Table 8. List of priorities for historical nickel deposits in the Kalgoorlie region

<i>Mining centre</i>	<i>Deposit</i>	<i>Quantity of past production</i>	<i>Style of mineralization</i>	<i>Tectonic setting</i>	<i>Type of commodity</i>	<i>Priority score</i>
Kambalda	Kambalda Dome deposits (initial drill holes)	3	2	2	Ni	20
Coolgardie	Nepean	2	2	2	Ni	16
Scotia	Scotia	2	2	2	Ni	16
Carr Boyd	Carr Boyd Rocks	2	2	2	Ni	16
Spargoville	Spargoville	2	2	2	Ni	16
Widgiemooltha	Widgiemooltha Dome deposits	2	2	2	Ni	16
Forrestania	Digger Rocks	2	2	2	Ni	16
Laverton	Windarra	2	2	2	Ni	16

Table 9. List of priorities for historical Cu–Pb–Zn deposits in the Kalgoorlie region

<i>Deposit</i>	<i>Quantity of past production</i>	<i>Style of mineralization</i>	<i>Tectonic setting</i>	<i>Type of commodity</i>	<i>Priority score</i>
Teutonic Bore	2	2	2	Cu–Pb–Zn	17
Murrin Murrin	1	2	2	Cu	13
Ravensthorpe	1	2	2	Cu	13

Table 10. List of priorities for other historical deposits in the Kalgoorlie region

<i>Deposit</i>	<i>Quantity of past production</i>	<i>Style of mineralization</i>	<i>Tectonic setting</i>	<i>Type of commodity</i>	<i>Priority score</i>
Londonderry	2	2	2	Pegmatite	18

Categories 2 to 7 — selection of drillcore to be archived on an annual basis

The initial storage capacity at Kalgoorlie and Perth is 10 to 15 years. The plan is to store, on an annual basis, 35 km of core that will be of benefit to the mining industry, and will assist and encourage exploration. Based on the priority score, drillcore can be ranked, with core with the highest priority score selected for

archiving. Listings of gold, nickel, Cu–Pb–Zn, and other deposits in Western Australia can be generated using the MINEDEX database (Townsend et al., 2000). Using the Kalgoorlie core library as an example, selection of core for the different categories is outlined below.

Category 2

Representative drillcore from the most significant projects or prospects

The scheme used to rank significant projects/prospects is as follows:

$$\begin{aligned}
 \text{Priority score} = & \text{Rating for size of project or prospect} \times 3 \\
 & + \\
 & \text{Rating for style of mineralization} \times 2 \\
 & + \\
 & \text{Rating for tectonic setting} \\
 & + \\
 & \text{Rating for type of commodity} \\
 & + \\
 & \text{Rating for mine status} \times 3 \\
 & + \\
 & \text{Rating for geographic spread} \times 2
 \end{aligned}$$

Tables 11–13 list significant projects or prospects, the core from which could be selected for archiving in the Kalgoorlie core library. The list of priorities is for mineral discoveries or project developments since 1986 and is based on the priority score as outlined above.

Table 11. Current list of priorities of significant gold projects or prospects from the Kalgoorlie region (based on mineral discoveries or project developments since 1986)

<i>Name</i>	<i>Size of project or prospect</i>	<i>Style of mineralization</i>	<i>Tectonic setting</i>	<i>Type of commodity</i>	<i>Mine status</i>	<i>Geographic spread</i>	<i>Priority score</i>
Chalice	2	1	1	Au	4	4	30
Kanowna Belle	3	3	2	Au	1	4	29
Sunrise Dam	3	3	1	Au	2	2	27
Havana Suva	2	3	2	Au	2	3	27
Granny Venn	1	3	1	Au	3	3	26
Bulletin (Wiluna)	3	1	1	Au	2	2	23
Harlequin	2	1	2	Au	2	3	23
Mount McClure	2	1	1	Au	3	2	23
Jundee	3	1	1	Au	1	3	22
Quarters	3	2	1	Au	1	2	22
Binduli North	2	3	2	Au	1	2	22
Plutonic	3	1	2	Au	1	2	21
Bronzewing	3	1	1	Au	1	2	20
Darlot Centenary	3	1	1	Au	1	2	20
Yilgarn Star	3	1	1	Au	1	2	20
Nimary	3	1	1	Au	1	2	20
Wallaby	3	2	1	Au	1	1	20
Chatterbox	2	1	2	Au	1	3	20
Ghost Crab	2	1	1	Au	2	2	20
Federal	2	1	1	Au	2	2	20
Sunrise	2	1	1	Au	2	2	20
White Foil	2	1	1	Au	1	3	19
St Ives	3	1	1	Au	1	1	18
Marymia	2	1	2	Au	1	2	18
Red October	2	1	2	Au	1	2	18
Rosemont	2	1	1	Au	1	2	17
Carosue Dam	1	1	1	Au	2	2	17
Cornishman	1	1	1	Au	2	2	17
Three Rivers	1	1	1	Au	1	2	14
Trident	1	1	1	Au	1	2	14
Famous Blue	1	1	1	Au	1	2	14
Fairyland	1	1	1	Au	1	2	14
Attila South	1	1	1	Au	1	2	14

Table 12. Current list of priorities of significant nickel projects or prospects from the Kalgoorlie region (based on mineral discoveries or project developments since 1986)

<i>Name</i>	<i>Size of project or prospect</i>	<i>Style of mineralization</i>	<i>Tectonic setting</i>	<i>Type of commodity</i>	<i>Mine status</i>	<i>Geographic spread</i>	<i>Priority score</i>
Silver Swan	2	2	2	Ni (sulfide)	3	3	29
RAV8	2	2	2	Ni (sulfide)	2	3	26
Mount Keith	3	2	2	Ni (sulfide)	1	2	24
Rockys Reward	2	2	2	Ni (sulfide)	2	2	24
Maggie Hays/ Emily Ann	3	2	2	Ni (sulfide)	1	2	24
Cosmos	2	2	2	Ni (sulfide)	1	3	23
Cawse	3	2	1	Ni (lateritic)	1	2	23
Bulong	3	2	1	Ni (lateritic)	1	2	23
Murrin Murrin	3	2	1	Ni (lateritic)	1	2	23
Ravensthorpe	3	2	1	Ni (lateritic)	1	2	23
Kalpini	3	2	1	Ni (lateritic)	1	2	23
Pinnacles	3	1	1	Ni (lateritic)	1	2	21
Honeymoon Well	3	1	1	Ni (sulfide)	1	2	21
Mount Margaret	3	1	1	Ni (lateritic)	1	2	21
Yakabindie	3	1	1	Ni (sulfide)	1	2	21
Goongarrie	3	1	1	Ni (lateritic)	1	2	21

Table 13. Current list of priorities of other significant projects or prospects in the Kalgoorlie region (based on mineral discoveries or project developments since 1986)

<i>Name</i>	<i>Size of prospect or project</i>	<i>Style of mineralization</i>	<i>Tectonic setting</i>	<i>Type of commodity</i>	<i>Mine status</i>	<i>Geographic spread</i>	<i>Priority score</i>
Nimbus	2	4	3	Ag–Zn	1	4	32
Trilogy	2	4	3	Cu–Pb–Zn	1	4	31
Windimurra	3	2	2	V–Ti	1	2	26

Category 3

Intersections of significant lithological, stratigraphic, structural, geochemical, geophysical or mineralization interest

The scheme used to prioritize significant projects or prospects is as follows:

$$\begin{aligned}
 \text{Priority score} = & \text{Rating for perceived significance of} \\
 & \text{geological feature} \times 4 \\
 & + \\
 & \text{Rating for possibility that the drillcore} \\
 & \text{may be inadequately stored, damaged} \\
 & \text{or destroyed} \times 2 \\
 & + \\
 & \text{Rating for likelihood that hole would} \\
 & \text{not be redrilled}
 \end{aligned}$$

As an example, Table 14 is a list of possible core for archiving in Kalgoorlie within this category. The ranking is based on the priority score as outlined above.

Table 14. Current list of priorities of drillcore containing intersections of significant lithological, stratigraphic, structural, geochemical, geophysical or mineralization interest in the Kalgoorlie region

<i>Geological feature</i>	<i>Reason for storage</i>	<i>Perceived significance</i>	<i>Possibility that core will be damaged or destroyed</i>	<i>Likelihood that hole would not be redrilled</i>	<i>Priority score</i>
Golden Mile Dolerite ('E' Series)	Stratigraphic and mineralization	4	2	2	22
Cundeelee anomaly	Geophysical anomaly	3	3	2	20
Jimberlana Intrusion	Stratigraphic and mineralization	2	2	2	14
Parkeston Dyke	Geophysical feature	2	2	2	14
Mount Ida Fault	Structural	2	2	2	14

Category 4

Representative drillcore from mining sites

The scheme used to prioritize core from mining sites is as follows:

$$\begin{aligned}
 \text{Priority score} = & \text{Rating for size of mine} \times 3 \\
 & + \\
 & \text{Rating for style of mineralization} \times 2 \\
 & + \\
 & \text{Rating for tectonic setting} \\
 & + \\
 & \text{Rating for type of commodity} \\
 & + \\
 & \text{Rating for mine status} \times 3 \\
 & + \\
 & \text{Rating for geographic spread} \times 2
 \end{aligned}$$

As an example, Table 15 is a list of possible core for archiving in the Kalgoorlie core library from mining sites. The ranking is based on the priority score as outlined above.

Table 15. Current list of priorities of drillcore from mining sites in the Kalgoorlie region

<i>Deposit</i>	<i>Size of mine</i>	<i>Style of mineralization</i>	<i>Tectonic setting</i>	<i>Type of commodity</i>	<i>Mine status</i>	<i>Geographic spread</i>	<i>Priority score</i>
Paddington	3	1	2	Au	3	2	25
New Celebration	2	1	2	Au	4	2	25
Ora Banda	2	1	2	Au	4	2	25
Granny Smith	3	3	2	Au	1	2	23

Category 5

Drillcore in areas that may not be accessible in the future (such as national parks, urban areas, and reserves)

The scheme used to prioritize drillholes in areas that may not be accessible in the future is as follows:

$$\begin{aligned}
 \text{Priority score} = & \text{Rating for type of commodity} \\
 & + \\
 & \text{Rating for perceived significance of} \\
 & \text{geological feature} \times 2 \\
 & + \\
 & \text{Rating for possibility that the drillcore} \\
 & \text{may be inadequately stored, damaged} \\
 & \text{or destroyed} \times 4 \\
 & + \\
 & \text{Extent of previous exploration and} \\
 & \text{mining in the area} \times 2 \\
 & + \\
 & \text{Amount of scientific investigation} \\
 & \text{carried out on drillcore}
 \end{aligned}$$

As an example, Table 16 is a list of possible core for archiving in the Kalgoorlie core library from locations that may not be accessible in the future. The ranking is based on the priority score as outlined above.

Table 16. Current list of priorities of drillcore from areas that may be inaccessible in the future (such as national parks, urban areas, and reserves) in the Kalgoorlie region

<i>Location</i>	<i>Type of commodity</i>	<i>Perceived significance</i>	<i>Possibility that core will be damaged or destroyed</i>	<i>Extent of previous exploration</i>	<i>Amount of scientific investigation</i>	<i>Priority score</i>
Bremer Bay – Hopetoun–Esperance area (national parks)	variety of commodities, including Au, Ni, base metals, and industrial minerals	2	2	3	1	22
Drilling in urban areas of Kalgoorlie	Au	4	1	2	1	18

Category 6

Drillcore from exceptionally deep drillholes (>1000 m) that are unlikely to be redrilled

The scheme used to prioritize exceptionally deep drillholes is as follows:

$$\begin{aligned} \text{Priority score} = & \text{Rating for type of commodity} \\ & + \\ & \text{Rating for perceived significance of} \\ & \text{geological feature} \times 4 \\ & + \\ & \text{Rating for possibility that the drillcore} \\ & \text{will be inadequately stored, damaged or} \\ & \text{destroyed} \times 2 \\ & + \\ & \text{Amount of scientific investigation} \\ & \text{carried out on drillcore} \end{aligned}$$

As an example, Table 17 is a list of possible core for archiving in the Kalgoorlie core library within the category of exceptionally deep drillholes. The ranking is based on the priority score as outlined above.

Table 17. Current list of priorities of drillcore from exceptionally deep drillholes that are unlikely to be redrilled in the Kalgoorlie region

<i>Location</i>	<i>Type of commodity</i>	<i>Perceived significance</i>	<i>Possibility that core will be damaged or destroyed</i>	<i>Amount of scientific investigation</i>	<i>Priority score</i>
Kalgoorlie (WDD3 = 3 km deep)	Au	4	4	3	28
Kambalda	Ni and Au	3	2	3	21
Kanowna Belle (>1 km hole)	Au	3	1	2	17

Category 7

Drillcore from remote areas difficult to access or where future access may not be possible

The scheme used to prioritize drillcore from remote areas is as follows:

$$\begin{aligned}
 \text{Priority score} = & \text{Rating for size of project or prospect} \times 3 \\
 & + \\
 & \text{Rating for style of mineralization} \times 2 \\
 & + \\
 & \text{Rating for tectonic setting} \\
 & + \\
 & \text{Rating for type of commodity} \\
 & + \\
 & \text{Rating for mine status} \times 3 \\
 & + \\
 & \text{Rating for perceived significance of geological feature} \times 4 \\
 & + \\
 & \text{Rating for possibility that the drillcore will be inadequately stored, damaged or destroyed} \times 2 \\
 & + \\
 & \text{Rating for likelihood that the drillhole would not be redrilled} \\
 & + \\
 & \text{Rating for amount of scientific investigation carried out on drillcore}
 \end{aligned}$$

As an example, Table 18 is a list of possible core for archiving in the Kalgoorlie core library within this category. The ranking is based on the priority score as outlined above.

Conclusion

The purpose of the selection criteria outlined in this Record is to provide a ‘transparent’ method of ranking drillcore for storage within the Western Australian core libraries. The criteria are based upon geological and other important parameters and, by using weighted parameters, the most appropriate core will be archived for future public viewing and research. The true test of these criteria is whether the core selected will be viewed by GSWA’s clients, that is, the mining industry, academia, government researchers, and the general public. Over time the selection parameters and their weighting may change, to reflect the changing needs of GSWA’s clients.

References

- FARR, P., 1995, Management Strategy for the Department of Mineral and Energy’s Storage Requirements: Peter Farr Consultants Australasia Proprietary Limited, West Perth (unpublished).
- TOWNSEND, D. B., GAO MAI, and MORGAN, W. R., 2000, Mines and mineral deposits of Western Australia: digital extract from MINEDEX — an explanatory note: Western Australia Geological Survey, Record 2000/13, 28p.

Table 18. Current list of priorities of drillcore from remote areas difficult to access or where future access may not be possible in the Kalgoorlie region

<i>Deposit/ Location</i>	<i>Size of prospect or project</i>	<i>Style of mineralization</i>	<i>Tectonic setting</i>	<i>Type of commodity</i>	<i>Mine status</i>	<i>Perceived significance</i>	<i>Possibility that core will be damaged or destroyed</i>	<i>Likelihood that hole would not be redrilled</i>	<i>Amount of scientific investigation</i>	<i>Priority score</i>
Menzies–Leonora area	1	1	1	diamond (kimberlite)	1	4	2	1	2	36
Nabberu	1	1	1	diamond (kimberlite)	1	4	1	2	2	35
Scaddan (Esperance)	2	1	2	lignite	1	2	2	2	2	33
Zanthus (Balladonia)	2	1	2	lignite	1	2	2	2	2	33
Salmon Gums (O’Sullivans)	2	1	2	lignite	1	2	2	2	2	33
Yeelirrie	3	1	1	uranium	1	2	1	1	2	32
Kookaburra prospect (WA–NT border)	1	1	1	Au	1	3	3	2	2	32
Fraser Range (isolated area)	1	2	2	variety of commodities	1	2	2	2	2	32
Mulga Rock (260 km east of Kalgoorlie)	1	1	1	uranium	1	3	1	2	2	31
Medcalf (180 km NW of Esperance)	1	1	1	V–Ti mineralization	1	2	2	2	2	29
Cosmo Newbery (reserve)	1	1	1	Ni and Au	1	2	2	3	2	28
Barrambie (near Sandstone)	1	1	1	V–Ti mineralization	1	2	2	1	2	28
Lake Cowan (beneath lake)	2	1	1	Au	1	2	1	1	2	26
Lake Raeside (beneath lake)	2	1	1	Au	1	2	1	1	2	26

Appendix

Policy for the storage of exploration samples in Western Australia

The following policy has been developed after wide consultation with industry and input from a working group comprising specific industry clients, consultants, and departmental representation. The draft policy was signed by the Director, Geological Survey of Western Australia, P. Guj, on 25 September 1995.

Policy statement

The Department of Mineral and Petroleum Resources supports industry and agrees that drillcore should be maintained for future exploration. To this end, Government has provided for the construction of two core libraries, one in Perth, and one in Kalgoorlie. Because of

the large amount of drillhole material obtained throughout Western Australia each year, the following policy provides details of what material will be archived. This policy is dynamic, and will change through consultation to reflect the changing activities of the resources industry and Government priorities.

The quantities of drillcore and other material to be archived are provided in Tables A1 and A2, and the storage requirements are outlined in Table A3. The period for retention of archived material is provided in Table A4 and disposal mechanisms given in Table A5. Table A6 outlines the range of issues that were considered in developing this policy.

Table A1. The quantity of core to be stored and maintained

<i>Issue</i>	<i>Percent retained</i>	<i>Value judgement</i>
Petroleum core and cuttings	Retain 100%	Core very expensive to replicate — governed by legislation: about 807 lm pa
Mineral exploration core		
Best representative section(s) from each significant project/prospect	Retain up to 100%	20 projects/prospects pa at 500 m of core/project
Intersections of significant lithological, stratigraphic, structural or mineralized interest; holes testing and/or displaying significant geochemical and/or geophysical anomalies	Retain up to 100%	5–10 holes pa — 2.5 km of core pa
Representative core from mining sites	Retain up to 100%	Assuming 2 mines pa, retain 2 holes/mine/pa at 500 m: approximately 2 km pa Backlog — worthwhile capture, say 100 sites × 2 holes/site each 500 m: approximately 100 km
Areas that will not be accessible in future (parks)	Retain up to 100%	2 holes drilled pa each 500 m: approximately 1 km pa
Exceptionally deep drillholes (e.g. >1000 m) that are unlikely to be redrilled	Retain up to 100%	Allow 2 km pa
Remote areas difficult to access or where future access may not be possible	Retain up to 100%	10 projects pa, generating approximately 10 km pa

NOTES: lm linear metre
pa per annum

Table A2. Other material

<i>Issue</i>	<i>Percent retained</i>	<i>Value judgement</i>
Engineering core	minimal	100 lm pa
Hydrogeology cores and cuttings samples	low volume	300 lm pa
Coal exploration cores	low volume	500 lm pa
GSWA drilling projects	retain all	5000 lm pa
Geochemical samples	retain all	75 m ³ pa
GSWA rock and fossil collection	selective	2 m ³ pa
General GSWA rock collection	selective	5 m ³ pa

NOTES: lm linear metre
pa per annum

Table A3. Storage requirements

<i>Issue</i>	<i>Storage requirements</i>	<i>Comment</i>
Oil samples	Refrigeration	To maintain the security and integrity of the samples stored (critical material will be stored by Geoscience Australia in Canberra)
Relinquishment palaeontology collection Thin section collections WAMEX/WAPEX reports GSWA fossil collection Exploration core standard core tray	Security	The storage environment is to ensure deterioration is minimized; however, oxidation of some material will, over time, destroy the original nature of the material

Table A4. How long will samples be retained for storage?

<i>Issue</i>	<i>Comment</i>
All core and cuttings will be retained indefinitely, unless revised by later drilling, or where oxidation has rendered the material of minimal value	It is legislated that petroleum core be retained indefinitely. Selected mineral exploration core provides ongoing valuable scientific information and is expensive and often difficult to replicate
All GSWA material to be assessed on an ongoing basis	Responsible management will make decisions on samples

Table A5. Disposal

<i>Issue</i>	<i>Comment</i>
Any drillcore for disposal will first be offered to the current project owner if applicable, and then offered to any other interested party prior to disposal as landfill	All disposals will be put to the Geological Survey Liaison Committee for approval
The only significant disposals will be of surface rock and bulk geochemistry soil samples where retention will be based on ongoing assessment	These samples are surface samples and can be more easily replicated

Table A6. Material to be collected, stored, and accessed

<i>Issue</i>	<i>Comment</i>
Petroleum exploration core, sidewall core, ditch cuttings, and oil fluid samples	It is a statutory requirement that (with the exception of Barrow Island) all petroleum cores be kept by Government. The following Acts are relevant: Commonwealth Petroleum (Submerged Lands) Act 1967, Western Australia Petroleum (Submerged Lands) Act 1982, and Western Australia Petroleum Act 1967
Petroleum relinquishment material: residues and palaeontology slides	Cost-savings to industry; expensive redrilling in offshore and remote areas may not be necessary
Mineral exploration core and cuttings (including surface samples, e.g. bauxite, mineral sands)	Industry strongly supports collecting, storing, and maintaining drillcore. A purpose-built core store will provide a secure archive that allows industry easy access to previously drilled core, which encourages research and in turn enhances exploration
Hydrogeology cuttings and core	
Engineering core (dam site investigations, offshore sea floor samples)	
Coal exploration cuttings and core	
Geochemical samples (usually 5 kg samples)	GSWA material archived or temporarily archived at the discretion of the Director, Geological Survey to assist in ongoing State geological investigations
GSWA projects: core and cuttings	
General GSWA rock collection used by field mapping geologists (currently 90 pallets)	
Small collection of industrial minerals and general rock/mineral specimens	
Other (e.g. powder samples)	