

# Unlocking NSW's Geoscience Information Archives



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Team Leader Geoscience Knowledge Management

# Geological Survey NSW Data assets

Data is the currency of exploration

Worth ~ \$2.5b



# GSNSW Data Delivery Systems

Data Centric towards Service Design for integrated delivery



Department  
of Industry  
Resources & Energy

Accessible from [www.resourceandenergy.nsw.gov.au](http://www.resourceandenergy.nsw.gov.au)

Miners & explorersInvestorsLandholders & communityEnergy consumersEnergy supply industry

IMERGeoscience informationApplications & approvalsSafety & healthCompliance & EnforcementPrograms & initiativesRules & forms

## Mineral exploration and mining in New South



Improved Management of Exploration Regulation

**DIGS**  
Search for exploration and geoscience reports

**EROL**  
Online lodgement of reports for exploration title holders

**GDW**  
Discover geoscientific data using Google Earth and simple web queries

**COMMON GROUND**  
Find current exploration and mining activity in your area

**MinView**  
Display and query exploration tenement and geoscience information

**GPC**  
Download geological and metallogenic maps, their vector data and other products

# Which Data Delivery System to use...



DiGS Document archive



MinView web map



Data warehouse  
point – related data



Google Earth viewer  
to all data



Product catalogue

Geology map

Gold occurrence

Drill hole location

Assay data

Exploration report

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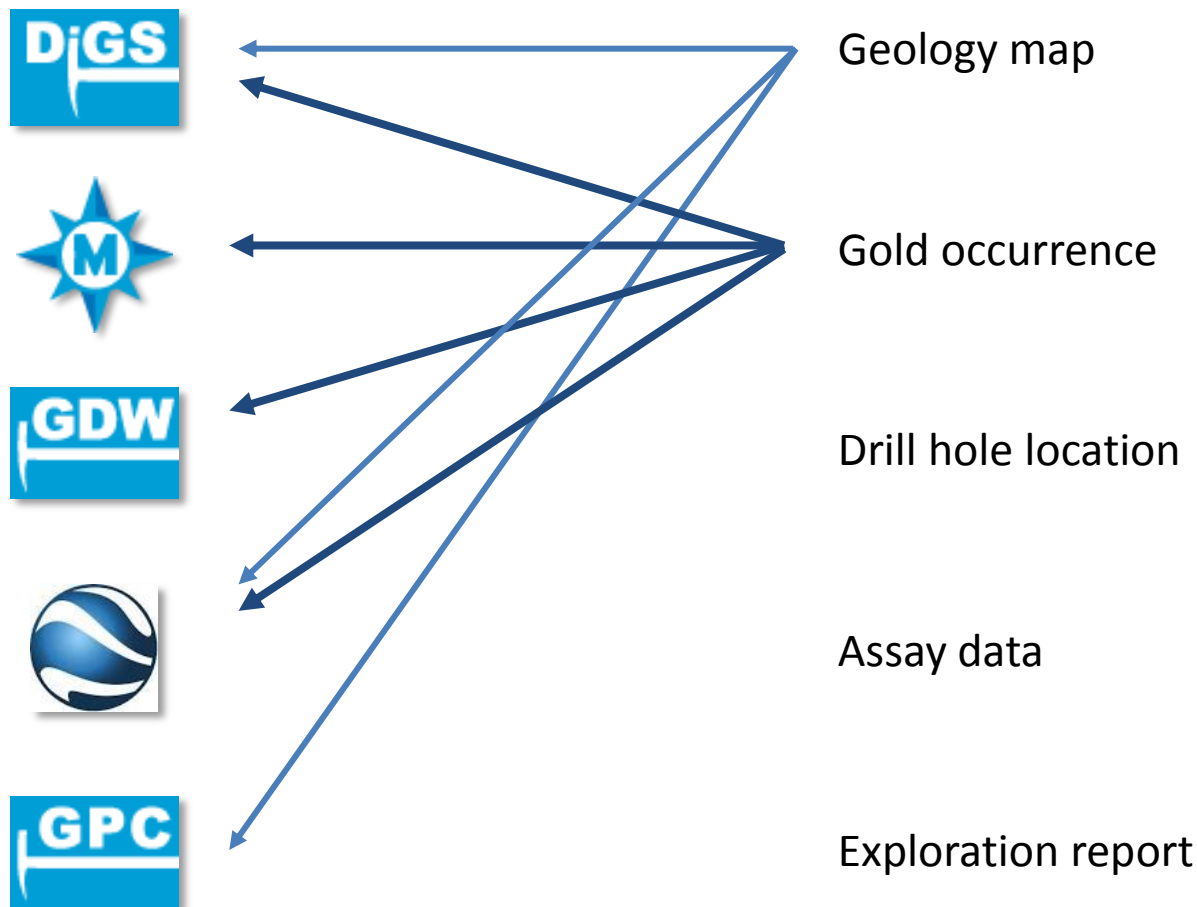
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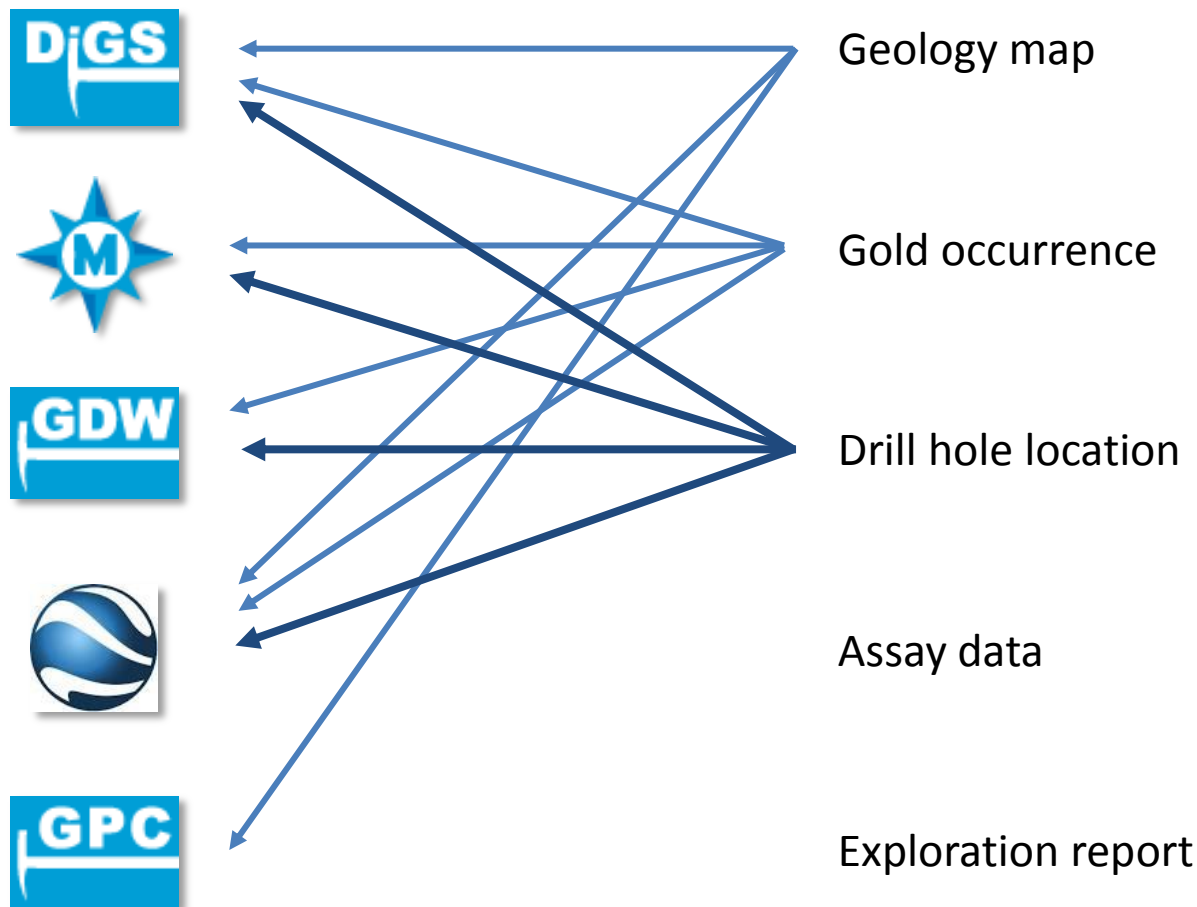
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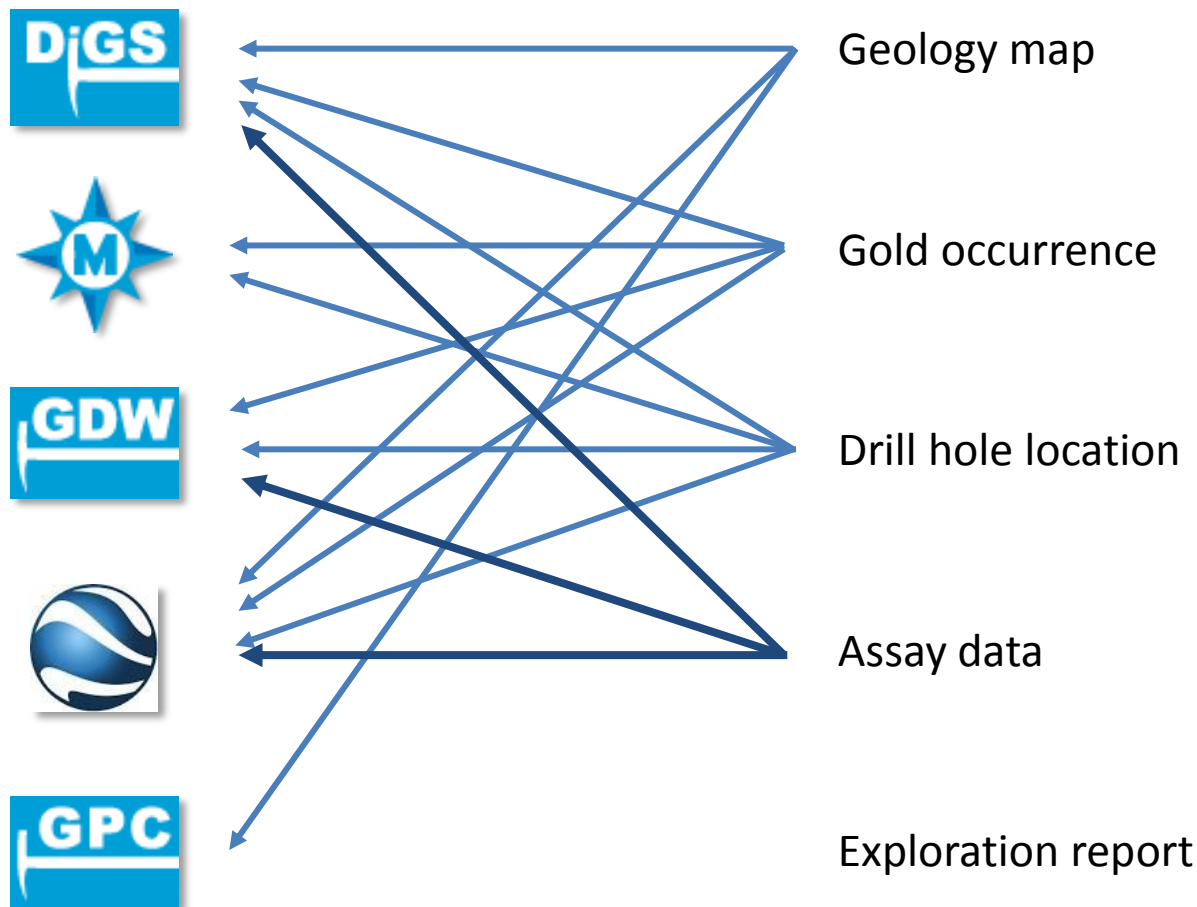


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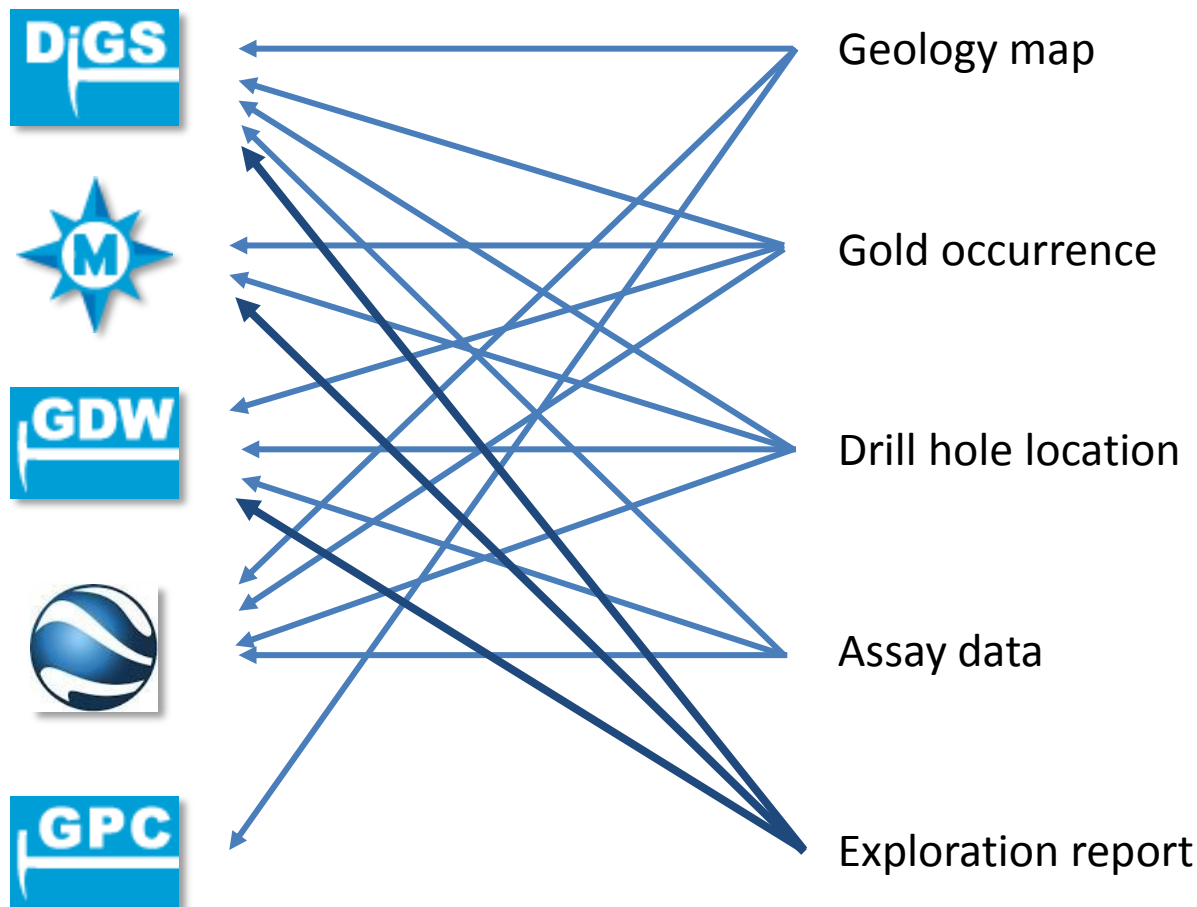
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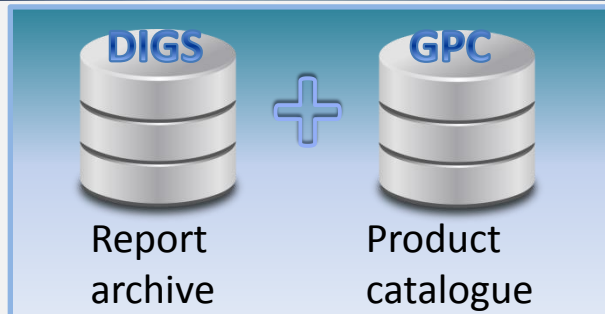


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# New DIGS : New Integrated Search



# Overview

1. *Explore the richness of (new) DIGS archive*
2. *Update Geoscience Information Gateway project*
3. *Describe the technical platform, design decisions & methodology employed*
4. *Demonstrate the New DIGS search engine*



# A Brief History of DIGS

## Digital Imaging of Geological System

1995 - 2000

- Digitisation of hardcopy (scanning)
- Report indexing (Metadata generation)
- Barcode (unique ids, RIN, DIN, BIN)
- File structure & open formats
- 32mb file limit

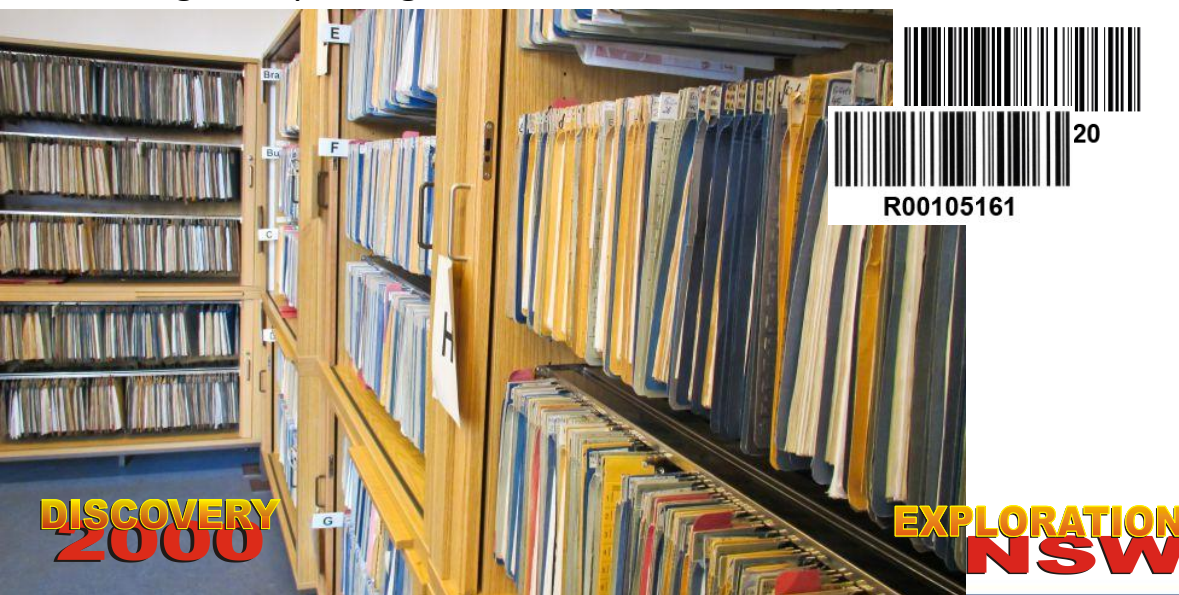
2000

- Online delivery (preview & download)
- digital reporting

2004 -2009

- Rewrite – tape to file server
- Extended with submission tool (EROL)
- Automated indexing
- Change to interface
- Aspatial document database

Oldest dated map - Map of the Colony of NSW 1834, by T L Mitchell with geology added by William Keene.



# A Brief History of the Online Catalogue

2012

- Database
- Data driven pages
- Spatial search
- Keyword search
- Filter
- A-Z listing
- Product details
- Spatial Extent
- Preview
- Related products
- Download high resolution & georeferenced data files

The screenshot displays the 'Geoscience Product Catalogue' interface. At the top, the NSW Government logo and 'Department of Industry Resources & Energy' are visible. The main search bar contains the text 'cargelligo'. Below the search bar, there are fields for 'Location', 'Lat', 'Lng', and 'Radius (km)'. A map of Australia is shown with a yellow pin at Cargelligo. The map includes labels for various cities and regions. Below the map, a table displays search results for 'Cargelligo'.

	NAME	EDITION	PRODUCT TYPE	SCALE	PUBLICATION DATE	COST
	Cargelligo 1:100 000 Geological Map	First Edition	Map sheet	1:100,000	2008	\$19.00
	Cargelligo 1:250 000 Geological Map	Third Edition	Map sheet	1:250,000	2006	\$19.00



# Available records in DIGS

## Reports Collection

- Exploration and mining company reports: geochemistry, geophysics, seismic, drill hole logs, downhole surveys, oil and gas surveys , mineral studies and geological interpretations
- Company environmental reports: EIS, MOP, REF, AEMR,POP, SMP Rehabilitation and Relinquishment reports
- Licence conditions: grant, renewal etc
- Title plans: mine plans, record tracings and survey diagrams
- Mine records: mine inspector reports, geological notes, mine plans, analytical data/assay outputs and incidents pertaining to a mine.
- Technical and Research reports
- Cartographic Plans
- Parish Maps

\* Heritage records – correspondence, field note books.

Report Type	Totals
Coal exploration	8276
Mineral exploration	35384
Opal exploration	1979
Petroleum exploration	2548
Environmental reports	870
<b>Total Exploration reports</b>	<b>49057</b>
Licence conditions documents	<b>2237</b>
Record tracing	1049
Survey plan	70749
Working plan	46
Consolidated lease	6
<b>Total Title plans</b>	<b>71850</b>
Mine records,	5523
Research reports, Annual Report Compilations (ARC)	3035
Cartographic plans	2398
Parish maps	466
<b>Total records</b>	<b>11422</b>



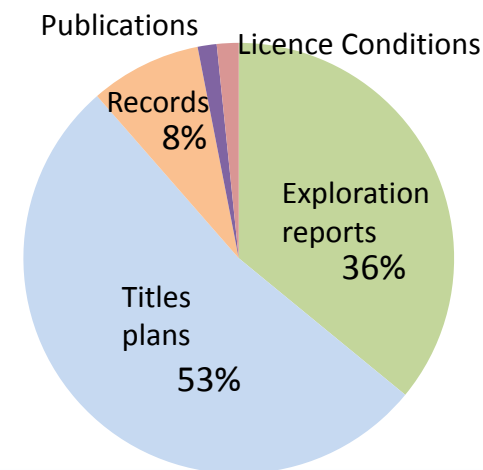
# Available records in DIGS

## Publication Collection

- Geology maps, metallogenic maps, mineral deposit maps, geophysical-geological maps, regolith maps, coastal quaternary maps, special interest
- Explanatory Notes for geological and metallogenic maps
- Bulletins
- Quarterly Notes
- Periodical such as Coal and Mineral Industry Profiles
- Non-periodicals (books such as the Geology field guide to NSW)
- Mineral Records, Memoirs, Annual Mineral compilations (ARC)
- Field excursion guides (from conferences and other events)
- Factsheets
- Scientific Posters
- Presentations
- Promotional posters, brochures and flyers

**DIGS combined total - over 140 000 reports  
approximately 3.5 million pages, or 2 terabytes of digital data**

Publication Type	Totals
Quarterly Notes	146
Explanatory Notes	85
Bulletins	41
Memoirs	46
Periodicals	86
Excursion guides	44
Non-periodicals	30
Posters	90
Presentations	49
Maps	438
Heritage maps	423
Parish maps	466
<b>Total Publications</b>	<b>1944</b>



## GSNSW's Custodial role over DIGS

*Custodian: a person who has custody; keeper; guardian, curator*

*Active custodian/curator is ...*

## Data manager

## Format authority

## Metadata provider

## Knowledge Disseminator

## Quality arbiter

## Content specialists

*Added value service provider*

# DIGS Data mining project

# Assay data modeling Data Warehouse

+ System architects & developers & maintainers

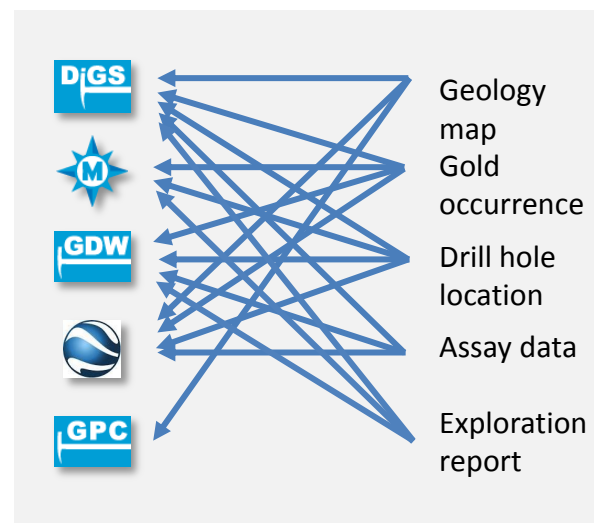


# System integration and renewal

## Geoscience Information Gateway project

*“Having worked in NSW for a number of years, I’ve worked out how to use (DIGS), and I see that as a competitive advantage over other companies just starting up in NSW”*

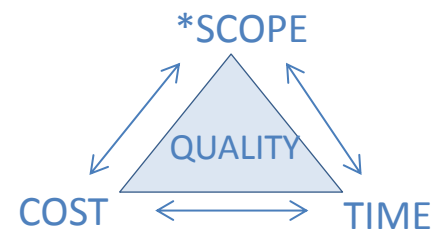
stakeholder quote



### Key Drivers

- Improved accessibility to all geoscience information held by GSNSW
- Aging technologies – custom made, not upgradable, not extendible, not std compliant, not mobile
- Good governance – robust, reliable systems, cost effective, secure

\*Geoscience Information Gateway Scope is  
– front end interfaces only – not databases



# Guiding design principles

“Easy public access to all validated non-confidential geoscientific and supportive reference data stored by the GSNSW from a single channel”

System	Functions
Flexible, Upgradeable	Meets user requirements
Scaleable, modularised design	Focus on Usability
Off the shelf technology Best of breed	Function & Performance over aesthetics
Configuration over coding	<b>Fit for Purpose</b>
Minimize dependencies/no plugins	Effective administration
Effective support	Secure
<b>Cost effective</b>	Mobile ready



# *New* DIGS Technology components



## **Enterprise document management system**

Document storage and workflows



## **Search engine**

Harvest and indexes document contents for searching



## **Optical Character Recognition software**

convert images to text to allow direct searching



## **JavaScript library for interactive maps**

used for defining area of interest

# Design – Pain Points

## Known problems with existing systems

**Reports Search** Help

Record Types to Search:

- ☒ Minerals
  - ☐ Mineral Exploration Reports
  - ☐ Mine Records
  - ☐ Research Reports
  - ☐ Annual Report Compilations
- ☒ Coal Exploration Reports
- ☒ Petroleum Exploration Reports
- ☒ Titles
  - ☐ Record Tracing
  - ☐ Survey Plan
  - ☐ Working Plan
  - ☐ Consolidated Lease
  - ☐ Exploration Licence Conditions
- ☒ Departmental Map Collection
  - ☐ Cartographic Maps
  - ☐ Heritage Maps
- ☒ Departmental Publications
- ☒ Environmental Reports
- ☐ Bibliographic Retrieval System
- ☒ Community Consultation

Report Number:

Report Identification Number:

Confidentiality:

Authors/Company Name:

Report Title:

Report Description:

Subject Terms/Keywords:

Report Year:

Tenement Name/Number:

Map Sheet:

Location:

Abstract:

Record Type:

Document Filter:

Results per page:

- Search metadata only
- Search dependent on quality metadata
- No field validation, text only
- Exact string match
- And Criteria applied between search fields
- Aspatial database

- Separate system for publications & GIS data files
- Duplication of records
- Single record download

**Department of Industry Resources & Energy** Geoscience Product Catalogue

SHOW FILTERS >

Location  Lat  Lng  Radius (km)

Displaying 1 to 10 of 18 results Results per page:

	NAME	EDITION	PRODUCT TYPE	SCALE	PUBLICATION DATE	COST
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[search.geoscience.nsw.gov.au](http://search.geoscience.nsw.gov.au)


DIGS

About

Basic Search


Advanced Search

LoginRegisterSaved Searches




Department  
of Industry  
Resources & Energy

beta



Geological Survey of New South Wales

AllReportsPublications



Click here  
to set your  
area

Search all items within the DIGS database and the Geoscience Product Catalogue

SEARCH

☐ Search for exact phrase

Sort by: RelevanceShow abstract: Yes

Advanced Search

# Search improvements

*Old*



*New*



Search criteria : Uranium in Broken Hill region

Subject = uranium

Location = Broken Hill

**Result 71 reports**

Single search field = uranium

Draw shape over broken hill

**Result 137 reports**

Search criteria : Asbestos

Subject = asbestos

**Result 134 reports**

Single search field = asbestos

**Result 190 reports**

Search criteria : Shoshonite

Subject = Shoshonite

**Result 5 reports**

Single search field = Shoshonite

**Result 794 reports**

Search criteria : fracking

Abstract = fracking

**Result 5 reports**

Single search field = fracking

**Result 325 reports**

[search.geoscience.nsw.gov.au](http://search.geoscience.nsw.gov.au)

