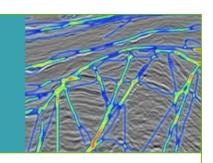
# OSO (EV)

#### Seismic 2019



# Seismic in the cloud



Why are we duplicating all our data?



Scale: Scale storage and computation to bigger data sets



**Optimise**: Use serverless technology to optimise cloud costs



Accelerate: Automate and parallelise tasks for rapid delivery



Enhance: Crowdsource, collaborate and tackle cognitive bias



Innovate: Data presented as arrays and images for data science

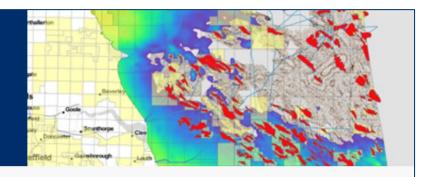
# FREE SEISMIC DATA

#### What's changed for UK seismic data?



Press Release: September 2020

#### OGA appoints firm to operate National Data Repository



The Oil and Gas Authority (OGA) has today appointed Osokey Ltd. as collaborative partner in developing the <u>National Data Repository</u> (NDR) platform, as a critical element of the OGA Digital Energy Platform

Osokey, which was awarded the contract following a competitive tender process will now start developing new services to go live in 2021. The service will continue to host a range of essential information including wellbores, geophysical surveys and petroleum infrastructure but will make inputting and accessing information easier for users. The new cloud-based approach will enable the OGA, for the first time, to host all reported information, including considerable volumes of legacy unprocessed seismic data, in our own systems.

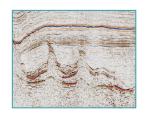
### What's changed in the NDR service?



Legacy service (to July 2021)	NDR service (July 2021 to date)
Service provider hosted "on premise" service	Osokey providing a cloud based service
Primary and disaster recovery located on premise in Aberdeen	Primarily located in Azure UK South, disaster recovery located in AWS in Europe
Stand alone System of Reference (SoR) independent of NSTA databases	Service now tightly coupled to NSTA's Well Operations Notification System (WONS)
Seismic reporting via media to support team incurring cost	Self-service seismic reporting free of charge
No visualisation or preview of contents	Preview visualation of reports and seismic
Download basket limited to 20GB	Up to 3TB of download per month for free



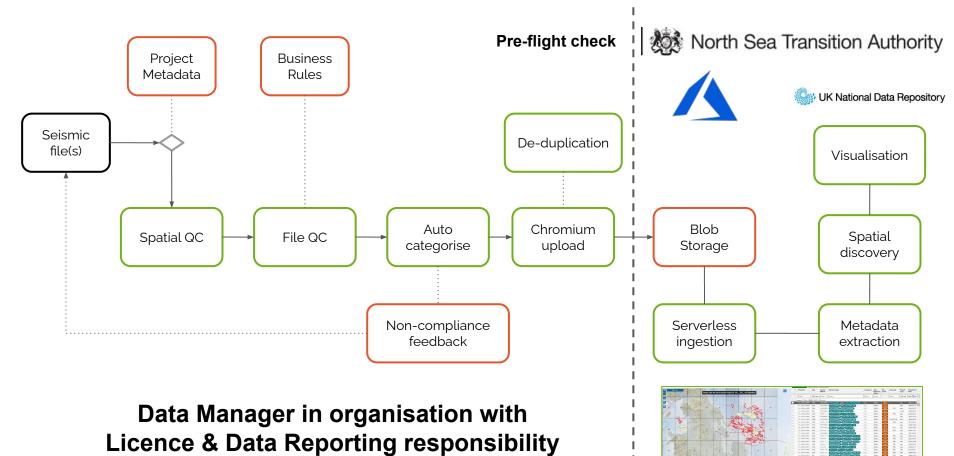


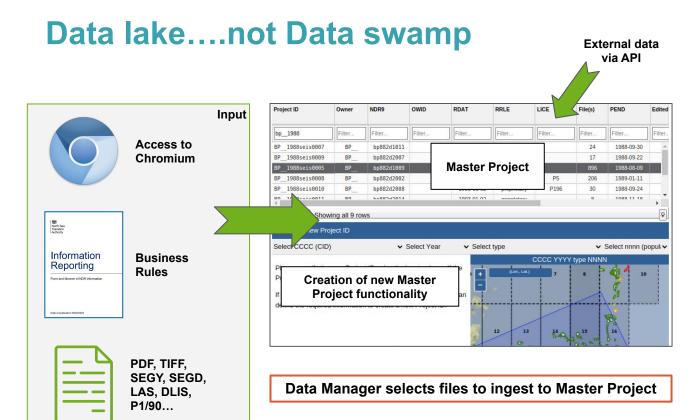




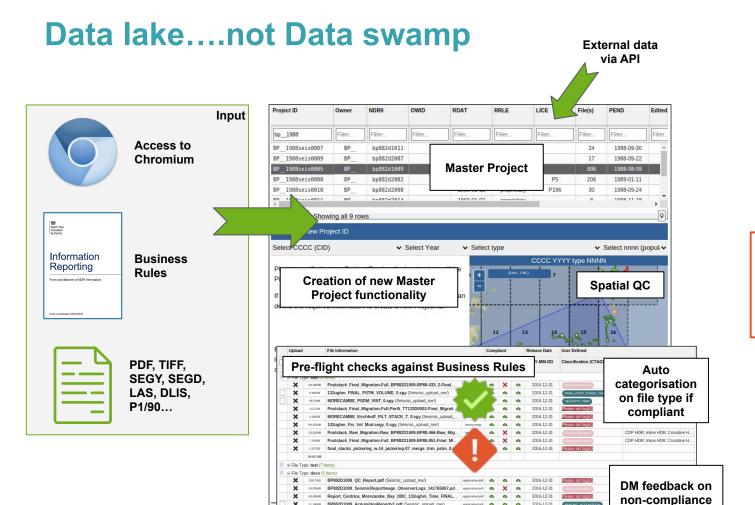
#### **Enabling self-service seismic reporting**





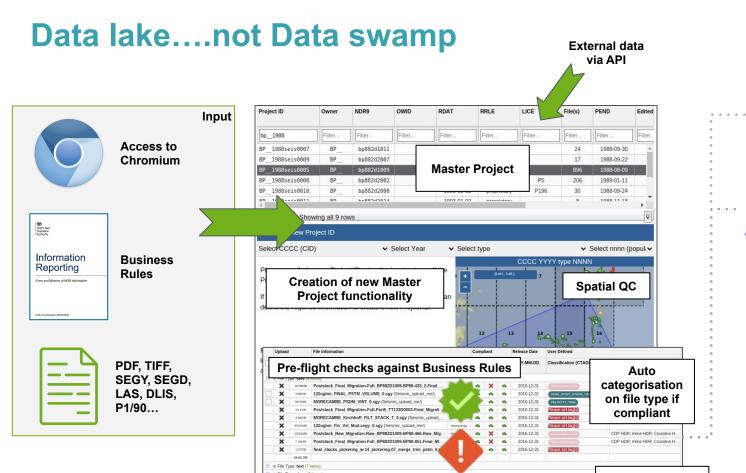








Compliant seismic data ready to upload?









DM feedback on non-compliance

Azure Blob storage

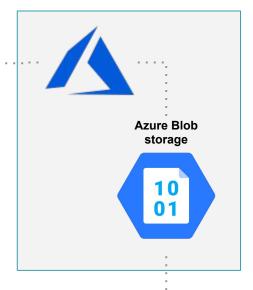




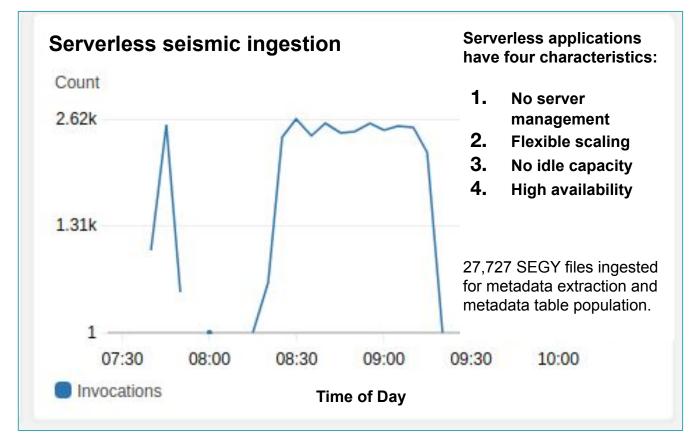
#### Seismic ingestion pipeline







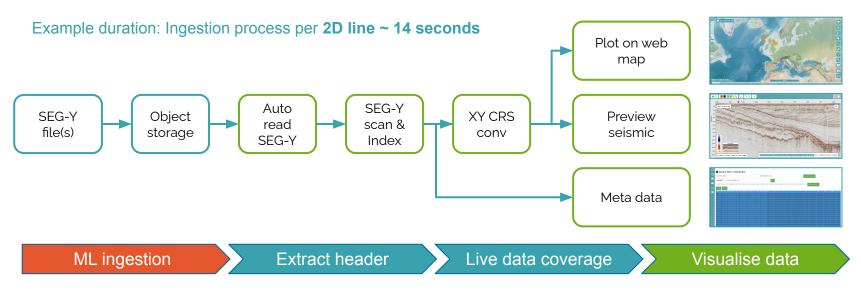




#### **Machine Learning data ingestion**



This can run at **scale** and in **parallel** using Osokey's **serverless** technology



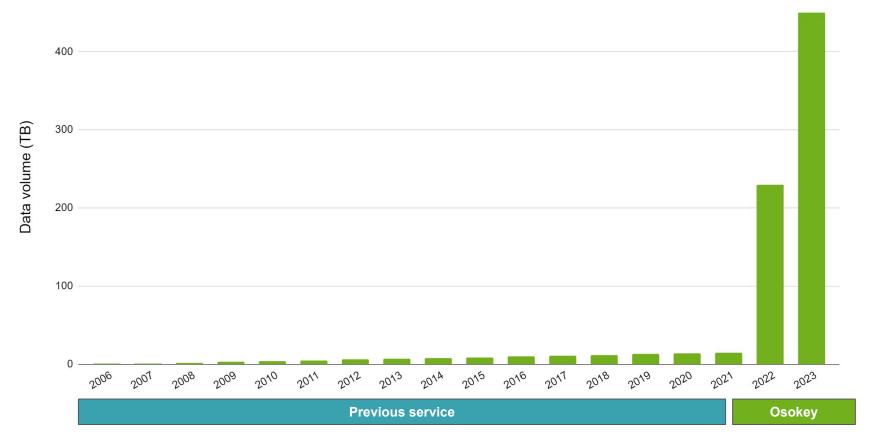
#### Recent operator example:

This was deployed on **hundreds of thousands** of files with a **manual intervention rate of less than 1%**.

#### **Enabling data at scale (March 2023)**

OSO SOLEY UNLOCKING POTENTIAL

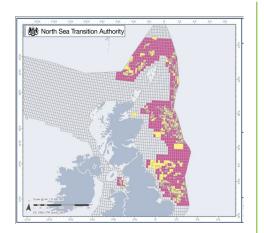
UK NDR data volume vs Year

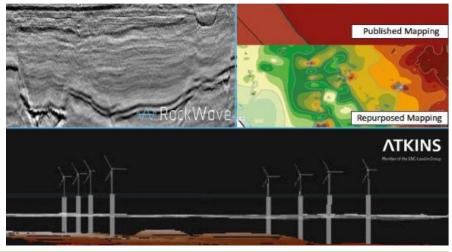


#### Reusing and Repurposing UK seismic

osokey

70 TB downloaded in 3 months at start of 33rd Offshore Licensing Round





Investigations off the coast to provide data about potential of deep rocks to host a Geological Disposal Facility (GDF).

From: Nuclear Waste Services
Published 29 July 2022



The survey vessel will be carrying specialist acoustic equipment



#### Related content

Our work with radioactive waste producers



Communities and GDF

National Geological Screening for a GDF further reading

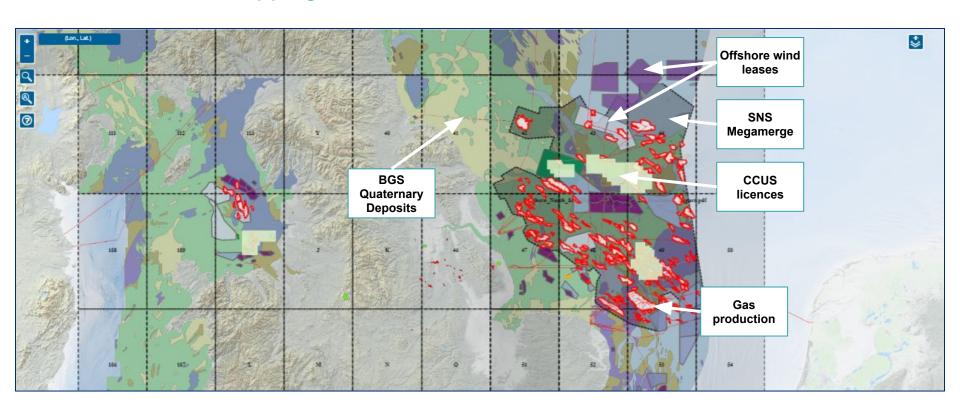




#### Data as a national asset

### osokey

Diverse and overlapping use cases



## FREE SEISMIC DATA





#### UK National Data Repository

*	Area	Project Type	Data Reporting Group	Survey / Well ID	Seismic Type	Description	Summary Tags	Released?	Project End Date	Release Date	Company I	File Count	Licence(s)	Project Size	
	Clear 🗸	Seisn 🗸	Filter	Filter	Clear 🗸	Filter	Filter		010 🗖 dd/ 🗖	dd/□ dd/□	Filter		Filter		
	NNS	seis	SUNCOR ENERGY INC.	SU133D00	3D	SUN13001	NAVIGATION	4	2013-06-05	2018-01-02	SNCR	1	P104,P193,P	2.6MB	A
	NNS	seis	TOTALENERGIES UPST	TT140BNA	OBS	ALWYN OBN 2014	REPORT_ACQUISITION	ø.	2014-06-17	2019-01-02	TT	1	P90,P119,P2	23.97MB	
	NNS	seis	ENQUEST PLC	BP134D00	4D	Magnus 2013	NAVIGATION	ø.	2013-07-13	2018-01-02	EQ	1	P193	2.8KB	1
	NNS	seis	ENQUEST PLC	BP113D00	3D	MAGNUS OBC	REPORT_ACQUISITION	ø.	2011-08-28	2016-01-02	EQ	1	P193	46.86MB	ı
	CNS	seis	SHELL PLC	SH12SCOT	4D	F-3068 SCOTER 2012 4D	NAVIGATION	ø	2012-08-12	2017-01-02	SH	1	P13,P185	191.98KB	1
	CNS	seis	TOTALENERGIES UPST	TT134D00	4D	ELGIN FRANKLIN 2D 4D 2013	NAVIGATION	ø.	2013-08-05	2018-01-02	11_	1	P188,P362,P	542.54MB	
	CNS	seis	TOTALENERGIES UPST	VL113D00	OBS	Isabella	NAVIGATION	d	2012-05-24	2017-01-02	TT	1	P1820	2.56KB	Į
	NNS	seis	BP EXPLORATION	BP174D00	4D	kinnoull 4d obn	NAVIGATION	d	2018-01-02	2022-01-01	BP	1	P103	238.56KB	
	CNS	seis	SHELL PLC	SH11GANN	4D	F-2871 GANNET ABCG 2011 4D	NAVIGATION	ø.	2011-06-13	2016-01-02	SH	1	P13,P1789,P	2.93KB	
	WOS	seis	BP EXPLORATION	BP174D00	4D	clair ridge uhdobn	NAVIGATION	d	2018-01-02	2023-01-02	BP	1	P165	64.86KB	
	WOS	seis	TOTALENERGIES UPST	TT144D00	4D	LAGGAN 2D 4D OBN 2014	REPORT_ACQUISITION	<b>d</b>	2014-10-16	2019-01-02	TT	1	P911	10.07MB	
	WOS	seis	TOTALENERGIES UPST	TT174D00	4D	LAGGAN TORMORE 4D 2017	NAVIGATION	ø.	2018-01-02	2022-01-01	TT_	1	P911,P1159,	584.32KB	
	CNS	seis	ANASURIA OPERATING	SH12ANAS	4D	F-3046 ANASURIA 2012 4D	NAVIGATION	ø.	2012-05-08	2017-01-02	ANAS	1	P13,P185	201.01KB	
	CNS	seis	SHELL PLC	SH10GANN	4D	F-2810 GANNET 2010 4D	NAVIGATION	ø.	2010-07-23	2015-01-02	SH	1	P13,P1563	39.58KB	
	CNS	seis	BP EXPLORATION	BP113D00	3D	MUNGO WEST OBC	REPORT_ACQUISITION REPORT_PROCESSING	<u> </u>	2011-08-01	2016-01-02	BP	2	P59	34.29MB	
	CNS	seis	BP EXPLORATION	BP113D00	3D	MACHAR OBC	REPORT_ACQUISITION REPORT_PROCESSING	· da	2011-06-11	2016-01-02	BP	2	P57	26.12MB	
	CNS	seis	TOTALENERGIES UPST	TT154D00	4D	ELGIN FRANKLIN 2D 4D 2015	NAVIGATION REPORT_ACQUISITION	d	2015-08-10	2020-01-02	тт_	2	P188,P362,P	1.3GB	
	CNS	seis	TOTALENERGIES UPST	TT144D00	4D	ELGIN FRANKLIN 2D 4D 2014	NAVIGATION REPORT_ACQUISITION	d	2014-08-15	2019-01-02	11_	2	P188,P362,P	567.9MB	
	NNS	seis	NORTH SEA TRANSITIO	LB22MM00	3D	Northern North Sea post-stack merg	FINAL_POST_STACK_TIME	ø.	2022-06-01	2022-09-23	0A	2	P9999	274.72GB	ī
	WOS	seis	NORTH SEA TRANSITIO	LB22MM00	3D	Faroe Shetland Basin (UK) - post st	FINAL_POST_STACK_TIME	ø.	2022-06-01	2022-09-30	0A	2	P9999	422.41GB	П
	CNS	seis	NORTH SEA TRANSITIO	LB22MM00	3D	Outer Moray Firth post-stack merge	FINAL_POST_STACK_TIME	d	2022-06-01	2022-09-16	0A	2	P9999	299.54GB	
	CNS	seis	NORTH SEA TRANSITIO	LB22MM00	3D	Central North Sea post-stack merge	FINAL_POST_STACK_TIME	ø.	2022-06-01	2022-09-07	0A	2	P9999	429.89GB	
	CNS	seis	BP EXPLORATION	BP103D00	3D	UK2801: MUNGO EAST OBC	NAVIGATION REPORT_ACQUISITION	d	2010-11-07	2015-01-02	BP	3	P59,E387	59.01MB	

#### Real world example: UK CNS, Isabella OBS



2012 2017 Prodn. Project Data Reporting Group Survey / Seismic Description Summary Tags Released? Project End Release Date Company | File Licence(s) **Project Size** Type Well ID Type Count 010 dd/ dd/ dd/ Seisn V Filter... Filter... Clear V Filter... Filter... Filter... Filter... Clear SUNCOR ENERGY INC. SU133D00... 3D SUN13001 2013-06-05 2018-01-02 P104.P193.P. 2.6MB NNS seis NAVIGATION 0 SNCR TOTALENERGIES UPST. TT140BNA... OBS ALWYN OBN 2014 0 2014-06-17 2019-01-02 P90.P119.P2. 23.97MB NNS TT seis REPORT ACQUISITION **ENQUEST PLC** BP134D00... 4D 2018-01-02 NNS seis Magnus 2013 C 2013-07-13 EQ\_\_ P193 2 8KB ENQUEST PLC 2016-01-02 NNS seis BP113D00... 3D MAGNUS OBC REPORT ACQUISITION C 2011-08-28 EQ\_\_ P193 46 86MB CNS seis SHELL PLC SH12SCOT... 4D F-3068 SCOTER 2012 4D NAVIGATION 0 2012-08-12 2017-01-02 SH 191.98KB CNS TOTALENERGIES UPST TT134D00... 4D ELGIN FRANKLIN 2D 4D 2013 0 2013-08-05 2018-01-02 542.54MB seis NAVIGATION TT\_ P188.P362.P CNS seis TOTALENERGIES UPST. VL113D00... OBS 0 2012-05-24 2017-01-02 P1820 2.56KB NAVIGATION NNS seis BP EXPLORATION BP174D00... 4D kinnoull 4d obn NAVIGATION 0 2018-01-02 2022-01-01 BP\_ P103 238.56KB SHELL PLC 0 2016-01-02 CNS SH11GANN... 4D F-2871 GANNET ABCG 2011 4D 2011-06-13 SH P13.P1789.P. 2.93KB seis NAVIGATION WOS seis BP EXPLORATION BP174D00... 4D clair ridge uhdobn NAVIGATION (2) 2018-01-02 2023-01-02 P165 64.86KB 2019-01-02 WOS seis TOTAL ENERGIES LIPST TT144D00... 4D LAGGAN 2D 4D OBN 2014 REPORT ACQUISITION 2014-10-16 TT\_ P911 10 07MB WOS seis TOTAL ENERGIES UPST TT174D00... 4D LAGGAN TORMORE 4D 2017 0 2018-01-02 2022-TT P911.P1159. 584 32KB NAVIGATION ANASURIA OPERATING F-3046 ANASURIA 2012 4D 2012-05-08 17-01-02 P13,P185 201.01KB CNS seis SH12ANAS... 4D 0 NAVIGATION CNS SHELL PLC F-2810 GANNET 2010 4D P13,P1563 39.58KB SH10GANN... 4D seis NAVIGATION Click the file BP EXPLORATION MUNGO WEST OBC 34.29MB CNS seis BP113D00... 3D REPORT ACQUISITION REPORT PROCESSING P59 BP EXPLORATION P57 26.12MB CNS seis BP113D00... 3D MACHAR OBC REPORT PROCESSING count to CNS seis TOTALENERGIES UPST. TT154D00... 4D ELGIN FRANKLIN 2D 4D 2015 NAVIGATION REPORT\_ACQUISITION P188.P362.P 1.3GB CNS seis TOTALENERGIES UPST. TT144D00... 4D ELGIN FRANKLIN 2D 4D 2014 REPORT\_ACQUISITION P188.P362.P 567.9MB NAVIGATION request data NNS NORTH SEA TRANSITIO. LB22MM00... 3D P9999 274.72GB seis Northern North Sea post-stack merg FINAL POST STACK TIME WOS NORTH SEA TRANSITIO. LB22MM00... 3D Faroe Shetland Basin (UK) - post st. P9999 422.41GB seis FINAL POST STACK TIME CNS NORTH SEA TRANSITIO. LB22MM00... 3D Outer Moray Firth post-stack merge 0 2022-06-01 2022-09-16 P9999 299.54GB seis FINAL POST STACK TIME OA 0 2022-06-01 2022-09-07 P9999 429.89GB CNS seis NORTH SEA TRANSITIO. LB22MM00... 3D Central North Sea post-stack merge FINAL POST STACK TIME OA\_\_ UK2801: MUNGO FAST OBC 2010-11-07 2015-01-02 P59,E387 CNS seis BP EXPLORATION BP103D00... 3D NAVIGATION | REPORT ACQUISITION C BP\_ 59.01MB ? Support Showing all 86 rows



#### Select, describe and submit your request

Submit Data Request for Project	ID, VL2011se	is0001 (VL113I	00001)						
Please use this form to submit a Data resolved usually within 28 days of the			A STATE OF THE PROPERTY OF THE	AND THE RESIDENCE OF THE PROPERTY OF THE PROPE		Carlo Contractive Management	e persons with th	e expectation that	the matter should be
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REPORT_PROCESSING					REPORT_ACQUISITION				0
REPORT_INTERPRETATION			0	0					
SURVEY ACQUISITION DATA:									
NAVIGATION		•			DATA_ACQUIRED			0	0
OBSERVER_LOG			0	0	IMAGE			0	0
DATA_SUPPORTING			0	0					
PRE STACK DATA (TIME):									
GATHERS_RAW_TIME				0	GATHERS_FINAL_TIME			0	0
PRE STACK DATA (DEPTH):									
GATHERS_RAW_DEPTH				0	GATHERS_FINAL_DEPTH			0	0
POST STACK DATA (TIME):									
FINAL_POST_STACK_TIME				0	POST_STACK_TIME			0	0
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HORIZON			0	0					



#### Select, describe and submit your request

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INTERPRETATION DATA:								
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#### Data requests are reviewed by NSTA team

Vour request for data has	s boon submitto	d The NSTA Data Co	ampliance To	am will review your request. Yo	ou chould rocoivo a	cummany notificatio	n by omai
Tour request for data fia	s been submitte	u. The NSTA Data Co	impliance re	ani wiii review your request. To	ou siloulu lecelve a	Summary Houncaud	ili by elliai
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I would like to reprocess this data for CCS potential use case therefore processing report and field data + pre-stack would be really helpful please



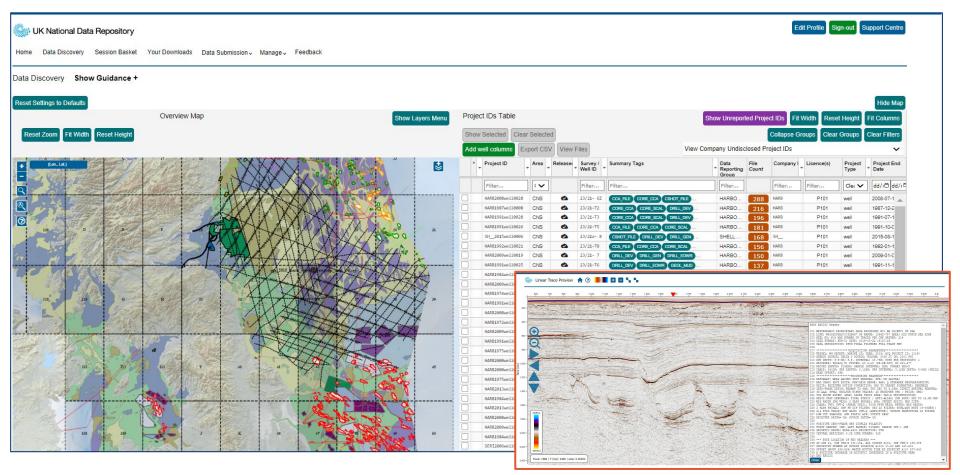


#### An approved request can be fulfilled multiple ways

C Tag	Request	Available	Unavailable	Not Acquired	C Tag	Request	Available	Unavailable	Not Acquired
SEISMIC REPORTS:									
REPORT_PROCESSING	✓			0	REPORT_ACQUISITION	✓			$\circ$
REPORT_INTERPRETATION			0	0					
SURVEY ACQUISITION DATA:									
NAVIGATION		•	0		DATA_ACQUIRED	✓		0	
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DATA_SUPPORTING			0	0					
PRE STACK DATA (TIME):									
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PRE STACK DATA (DEPTH):									
GATHERS_RAW_DEPTH				0	GATHERS_FINAL_DEPTH			0	
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### Data discovery and preview in the NDR





#### **Enabling data at scale (March 2023)**

OSO SOLEY UNLOCKING POTENTIAL

UK NDR data volume vs Year

