



Petrel Data Cleanup

For

Studio



Real World Examples and Workflow Details

- **Petoro** Example - Petrel REF cleanup
- Workflow & Tools
- DM tools on Studio Manager - Demo



Petoro Example

Petrel REF cleanup



Petoro - Petrel Ref project cleanup

- Audit the Petrel REF projects
- Discuss audit results with the users
- Address the agreed upon issues
- Re-audit the REF projects
- Present the results



Audit the Petrel REF projects

Well Missing CRS Name/Type	0	0	0	0
Well Audits:				
Unlikely KB Reference Offset (KB<2 or KB>50 meter)	453	362 (many test wells)	0	0
Unlikely KB Reference Offset (KB=0 meter)	7	253 (only test wells tlp)	0	0
Unlikely Max Borehole MD (MD<600 or MD>7000 meter)	51	111 (mostly test wells) 2 real wells	0	0
Missing Operators	560	457	2	3
Wells Missing UWI	276	450	2	3
Missing Well Symbol	148	304 (many tlp wells)	0	0
Well Log Audits:				
Wells With Logs Below TD (Tol. 0.1 meter)	299	18 (needs to be checked)	2	1
Well Logs Missing Samples	149	2	0	0
Duplicate Global Well Logs	407 (mostly normal names)	470 (many strange most with a count of 1)	0	0
Well Top Audits:				
Well Tops Duplicate Depths	0	0	0	0
Well Tops Duplicate Observation Num	17	0	0	0
Well Tops Illegal Names	67 (missing strat columns)	46	0	0
Well Tops Invalid Depths	0	0	0	0
Well Tops Missing Observation Number	0	0	0	0
Well Tops Missing Interpreter	0	0	0	0
Seismic Audits:				
Checkshots With Errors	104	9	0	2



Discuss audit results with the users

- Duplicate GWL's – (user sensitive to Well Log Collection ?)
- Quasi Duplicate GWL's – (renamed on purpose?(Well Log Collections))
- Stratigraphic Charts & Well Top cleanup
- Missing UWI/data_source/observation numbers
- KB/TD (incorrect & missing)
- Log data below TD
- Etc.



Address the agreed upon issues

- Manually collect & input the missing KB/coordinates/etc
- Manually check & fix logs below TD
- Well Log Manager
- Strat Cleanup
- Fix Well Headers
- Fix Missing Data_source
- Fix Observation Numbers
- Fix Checkshots



Re-Audit the Petrel REF projects

Well Missing CRS Name/Type	0	0	0	0
Well Audits:				
Unlikely KB Reference Offset (KB<2 or KB>50 meter)	0	0	0	0
Unlikely KB Reference Offset (KB=0 meter)	0	0	0	0
Unlikely Max Borehole MD (MD<600 or MD>7000 meter)	0	0	0	0
Missing Operators	0	0	0	0
Wells Missing UWI	0	0	0	0
Missing Well Symbol	148	304 (many tlp wells)	0	0
Well Log Audits:				
Wells With Logs Below TD (Tol. 0.1 meter)	0	0	0	0
Well Logs Missing Samples	0	0	0	0
Duplicate Global Well Logs	0	0	0	0
Well Top Audits:				
Well Tops Duplicate Depths	0	0	0	0
Well Tops Duplicate Observation Num	0	0	0	0
Well Tops Illegal Names	67 (missing strat columns)	0	0	0
Well Tops Invalid Depths	0	0	0	0
Well Tops Missing Observation Number	0	0	0	0
Well Tops Missing Interpreter	0	0	0	0
Seismic Audits:				
Checkshots With Errors	0	0	0	0



Present the results

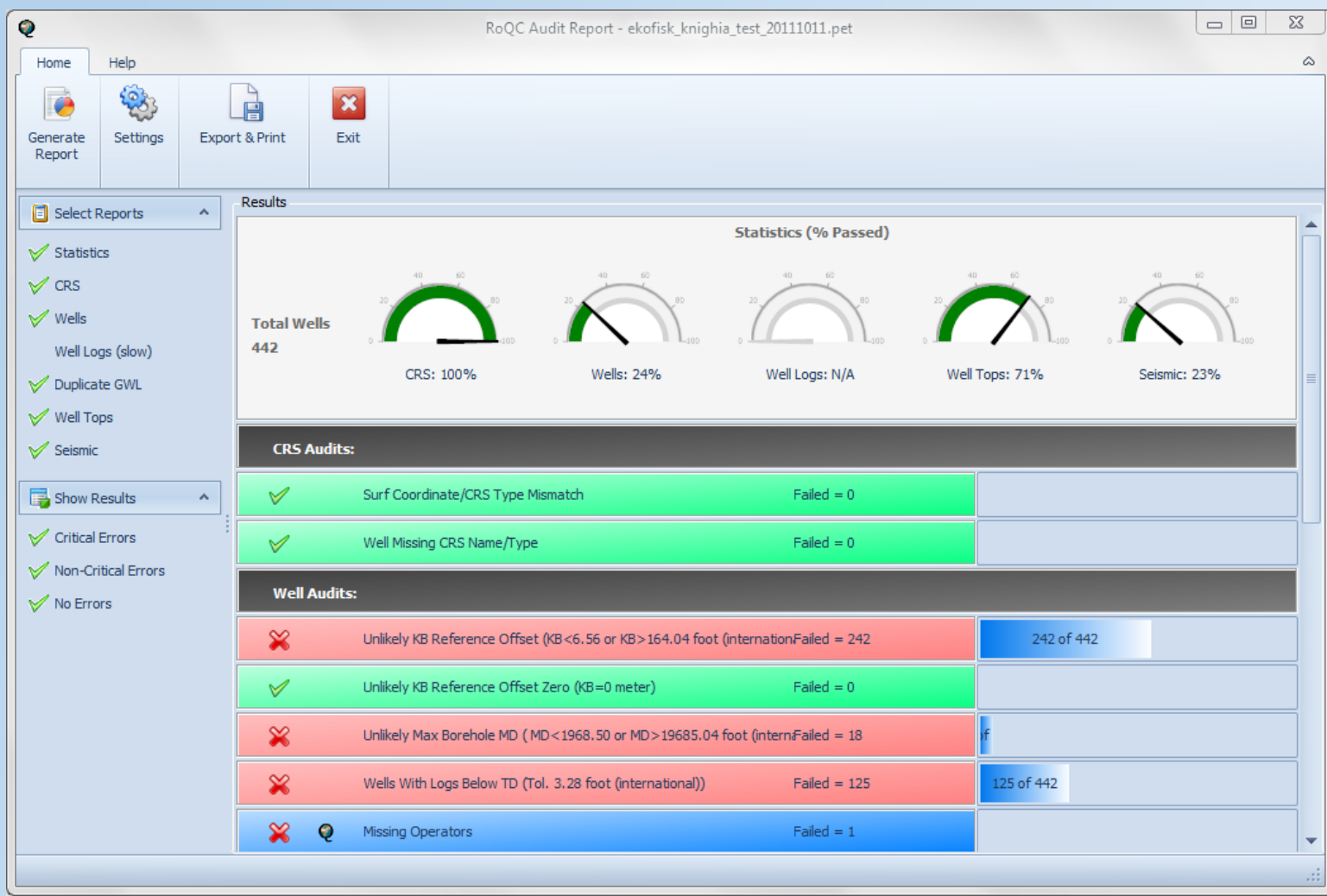
- Duplicate GWL's – merged
- Quasi Duplicate GWL's – many merged some left (GWL Collections)
- Strat Charts & Well Top cleanup – cleanup done where charts defined
- Missing UWI/data_source/occurrence numbers - fixed
- KB/TD (incorrect & missing) – collected & input (time consuming)
- Log data below TD – many decisions need to be made by users (TD checked first)
- Etc.. – rate limiting steps are with the users....



Some of the Tools Used



1. Audit Report





2. Fix Missing Observation Numbers

- Example of tools designed to fix very specific problems – pre-Studio

Marker Collection Name	Well Name	Well UWI	Surface Name	Interpreter	Z	MD	TWT Picked	TWT Auto	Geological Age	TVT	TST	Dip Angle	Dip Azimuth	Missing	Used by Dep. Conv.
Well tops	1/3-11		ANDREW FM		-3309.10	3366.00									
Well tops	1/3-11		BALDER FM		-3137.10	3194.00									
Well tops	1/3-11		EKOFISK FM		-3445.10	3502.00									
Well tops	1/3-11		FORTIES FM		-3225.10	3282.00									
Well tops	1/3-11		HORDALAND GP		-1724.60	1777.00									
Well tops	1/3-11		LISTA FM		-3286.10	3343.00									
Well tops	1/3-11		NO FORMAL NAME		-2543.10	2600.00									
Well tops	1/3-11		NORDLAND GP		-72.00	114.00									
Well tops	1/3-11		ROGALAND GP		-3137.10	3194.00									
Well tops	1/3-11		SELE FM		-3148.10	3205.00									
Well tops	1/3-11		SELE FM		-3262.10	3319.00									
Well tops	1/3-11		SHETLAND GP		-3445.10	3502.00									
Well tops	1/3-11		VADE FM		-2537.10	2594.00									
Well tops	1/3-12 S		ÅSGARD FM		-5289.35	5398.00									
Well tops	1/3-12 S		BLODØKS FM		-4966.56	5075.00									
Well tops	1/3-12 S		CROMER KNOLL GP		-5079.51	5188.00									
Well tops	1/3-12 S		EKOFISK FM		-3364.82	3473.00									
Well tops	1/3-12 S		FARSUND FM		-5447.01	5556.00									
Well tops	1/3-12 S		FORTIES FM		-3158.82	3267.00									
Well tops	1/3-12 S		HAUGESUND FM		-5517.72	5627.00									
Well tops	1/3-12 S		HIDRA FM		-4973.56	5082.00									
Well tops	1/3-12 S		HOD FM		-3983.81	4092.00									
Well tops	1/3-12 S		HORDALAND GP		-1808.42	1864.00									
Well tops	1/3-12 S		LISTA FM		-3230.82	3339.00									
Well tops	1/3-12 S		LISTA FM		-3163.82	3272.00									
Well tops	1/3-12 S		MANDAL FM		-5432.05	5541.00									
Well tops	1/3-12 S		MAUREEN FM		-3340.82	3449.00									
Well tops	1/3-12 S		NO GROUP DEFINED		-5707.44	5818.00									

Marker Collection Name	Well Name	Well UWI	Surface Name	Interpreter	Z	MD	TWT Picked	TWT Auto	Geological Age	TVT	TST	Observation Number
Well tops	1/3-11		ANDREW FM		-3309.10	3366.00						
Well tops	1/3-11		BALDER FM		-3137.10	3194.00						
Well tops	1/3-11		EKOFISK FM		-3445.10	3502.00						
Well tops	1/3-11		FORTIES FM		-3225.10	3282.00						
Well tops	1/3-11		HORDALAND GP		-1724.60	1777.00						
Well tops	1/3-11		LISTA FM		-3286.10	3343.00						
Well tops	1/3-11		NO FORMAL NAME		-2543.10	2600.00						
Well tops	1/3-11		NORDLAND GP		-72.00	114.00						
Well tops	1/3-11		ROGALAND GP		-3137.10	3194.00						
Well tops	1/3-11		SELE FM		-3148.10	3205.00						
Well tops	1/3-11		SELE FM		-3262.10	3319.00						
Well tops	1/3-11		SHETLAND GP		-3445.10	3502.00						
Well tops	1/3-11		VADE FM		-2537.10	2594.00						
Well tops	1/3-12 S		ÅSGARD FM		-5289.35	5398.00						
Well tops	1/3-12 S		BLODØKS FM		-4966.56	5075.00						
Well tops	1/3-12 S		CROMER KNOLL GP		-5079.51	5188.00						
Well tops	1/3-12 S		EKOFISK FM		-3364.82	3473.00						
Well tops	1/3-12 S		FARSUND FM		-5447.01	5556.00						
Well tops	1/3-12 S		FORTIES FM		-3158.82	3267.00						
Well tops	1/3-12 S		HAUGESUND FM		-5517.72	5627.00						
Well tops	1/3-12 S		HIDRA FM		-4973.56	5082.00						
Well tops	1/3-12 S		HOD FM		-3983.81	4092.00						
Well tops	1/3-12 S		HORDALAND GP		-1808.42	1864.00						
Well tops	1/3-12 S		LISTA FM		-3230.82	3339.00						
Well tops	1/3-12 S		LISTA FM		-3163.82	3272.00						
Well tops	1/3-12 S		MANDAL FM		-5432.05	5541.00						
Well tops	1/3-12 S		MAUREEN FM		-3340.82	3449.00						
Well tops	1/3-12 S		NO GROUP DEFINED		-5707.44	5818.00						



3. Well Log Manager

RoQC Well Log Manager - STRAT_TEST_2013.pet

Manage GWLs Duplicate GWLs Help

Reload Move Move & Delete Convert Units Preserve Values Fix Export & Print Exit

Mode Unit Conversion

Groups Selected: 1 Groups Shown: 21 Show Controls

Destination	Source	Log Version	Collection Name	Template Name	UOM	Borehole Usage Count	Writable	Changes
Global Well Log Name: AC								
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Global well logs	General	Dimensionless		35	Yes	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Global well logs	Sonic	Low_Acoustic_Slowness		3	Yes	
Global Well Log Name: ACS								
<input type="checkbox"/>	<input type="checkbox"/>	Global well logs	General	Dimensionless		31	Yes	
<input type="checkbox"/>	<input type="checkbox"/>	Global well logs	General	Dimensionless		2	Yes	
Global Well Log Name: AZIM_2_0								
<input type="checkbox"/>	<input type="checkbox"/>	MWD_Logs	Dip azimuth	Rotation		3	Yes	
<input type="checkbox"/>	<input type="checkbox"/>	MWD_Logs	Dip azimuth	Rotation		3	Yes	
<input type="checkbox"/>	<input type="checkbox"/>	MWD_Logs	Dip azimuth	Rotation		3	Yes	
<input type="checkbox"/>	<input type="checkbox"/>	MWD_Logs	Dip azimuth	Rotation		2	Yes	
<input type="checkbox"/>	<input type="checkbox"/>	MWD_Logs	Dip azimuth	Rotation		1	Yes	
<input type="checkbox"/>	<input type="checkbox"/>	MWD_Logs	Dip azimuth	Rotation		1	Yes	
<input type="checkbox"/>	<input type="checkbox"/>	MWD_Logs	Dip azimuth	Rotation		1	Yes	
Global Well Log Name: BS								
<input type="checkbox"/>	<input type="checkbox"/>	Global well logs	Caliper	Cylinder_Diameter		256	Yes	
<input type="checkbox"/>	<input type="checkbox"/>	Global well logs	Caliper	Cylinder_Diameter		23	Yes	
Global Well Log Name: CALI								
<input type="checkbox"/>	<input type="checkbox"/>	Global well logs	Caliper	Cylinder_Diameter		904	Yes	
<input type="checkbox"/>	<input type="checkbox"/>	Global well logs	Caliper	Cylinder_Diameter		21	Yes	
Global Well Log Name: DEN								
<input type="checkbox"/>	<input type="checkbox"/>	Global well logs	Density	Densitv		905	Yes	

RoQC Well Log Manager - STRAT_TEST_2013.pet

Manage GWLs Duplicate GWLs Help

Reload Convert Units Preserve Values Delete Export & Print Exit

Unit Conversion

Source GWL	Global Well Log	Log Version	Collection	Template	Borehole Count	UOM
gr	Global well logs	General				
BGRC	MWD_Logs	General			1	Dime
CGR	Global well logs	Gamma ray			2	API
DGRCC	Global well logs	Above contact			1	Stan
ECGR	Global well logs	Gamma ray			1	API
GMGRC	Global well logs	Above contact			1	Stan
GR	Global well logs	Gamma ray			962	API
GR	Global well logs	Gamma ray			30	API
GR_ARC	MWD_Logs	General			1	Dime
GR_ARC_FILT	MWD_Logs	General			1	Dime
GR_ARC_RAW	MWD_Logs	General			1	Dime
GR_fred	MWD_Logs	General			3	Dime
GRAM	MWD_Logs	General			1	Dime
GPRM	MWD_Logs	General			1	Dime

Target GWL

Global Well Log	Log Version	Collection	Template	Borehole Count	UOM
gr	Global well logs	General			
AGR	MWD_Logs	General			
AGRA	MWD_Logs	General			
AGRB	MWD_Logs	General			
BGRC	MWD_Logs	General			
CGR	Global well logs	Gamma ray			
DGRCC	Global well logs	Above contact			
ECGR	Global well logs	Gamma ray			
GMGRC	Global well logs	Above contact			
GR	Global well logs	Gamma ray			
GR	Global well logs	Gamma ray			
GR_ARC	MWD_Logs	General			
GR_ARC_FILT	MWD_Logs	General			
GR_ARC_RAW	MWD_Logs	General			

Source Logs GR_fred:MWD_Logs

Borehole Collection	Well Name	Well UWI	Well Log Collection	Well Log	Sample
Wells	24/12-5 S		MWD_Logs	GR_fred	
Wells	25/11-24		MWD_Logs	GR_fred	
Wells	25/11-25 S		MWD_Logs	GR_fred	

Target Logs GR:Global well logs

Borehole Collection	Well Name	Well UWI	Well Log Collection	Well Log	Sample
Not Public	34/3-2 S			Well logs	
Wells	1/2-1			Well logs	
Wells	1/2-2			Well logs	
Wells	1/3-1			Well logs	
Wells	1/3-12 S			Well logs	

Move



4 Strat Cleanup

RoQC Strat Cleanup - STRAT_TEST_2013.pet

Home Help

Reload Rename Delete Export & Print Exit

Selected: 2 of 145 [Show Controls](#)

Find Clear

Marker Collection Name	Surface Name	Data Type	Marker Count
Well tops	SVARTE FM	Horizon	93
Well tops	TANG FM	Horizon	4
Well tops	TARBERT FM	Horizon	72
Well tops	TARE FM	Horizon	4
Well tops	TAU FM	Horizon	35
Well tops	TEIST FM	Horizon	2
Well tops	TEIST FM (INFORMAL)	Horizon	3
Well tops	TOR FM	Horizon	209
Well tops	TRYGGVASON FM	Horizon	75
Well tops	TUXEN FM	Horizon	29
Well tops	TY FM	Horizon	61
Well tops	TYNE GP	Horizon	56
Well tops	ULA FM	Horizon	25
Well tops	ULA FM EKV	Horizon	1
Well tops	UNDEFINED	Horizon	19
Well tops	UNDIFFERENTIATED	Horizon	25
Well tops	UTSIRA	Horizon	1
Well tops	UTSIRA FM	Horizon	278
Well tops	VADE FM	Horizon	14
Well tops	Våle Fm	Horizon	1
Well tops	VÅLE FM	Horizon	281
Well tops	VESTLAND GP	Horizon	134
Well tops	VIDAR FM	Horizon	14
Well tops	VIKING GP	Horizon	258
Well tops	ZECHSTEIN GP	Horizon	66

Select the new name

Name Data Type

- CROMER KNOLL GP Top Event
- CROMER KNOLL GP Zone
- Event 6 Event
- Unknown Column
- Nordland GP Top Event
- UTSIRA FM Zone
- Nordland GP Base Event
- VADE FM Zone
- ROGALAND GP Top Event
- BALDER FM Zone
- SELE FM Top Event
- SELE FM Zone
- LISTA FM Top Event
- LISTA FM Zone
- VÅALE FM Top Event
- VAALE FM Zone
- SHETLAND GP Top Event
- CROMER KNOLL GP Top Event
- Event 6 Event

Apply Ok Cancel



5. Etc

- Other tools
- Petrel – intelligent use of filtering tools [inc. Find]
- Excel - collating missing data [from CDA, NPD, Petrobank, etc.]



Welcome to the new world
of
😊 Petrel Data Management 😊