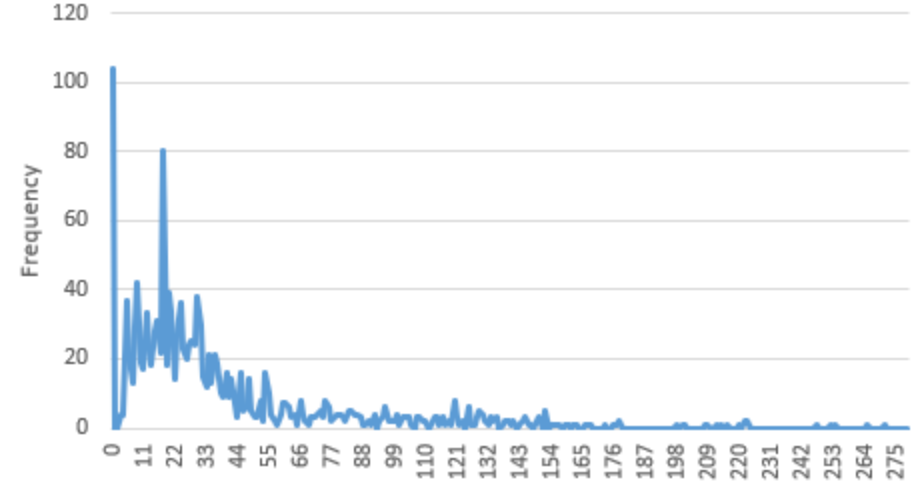


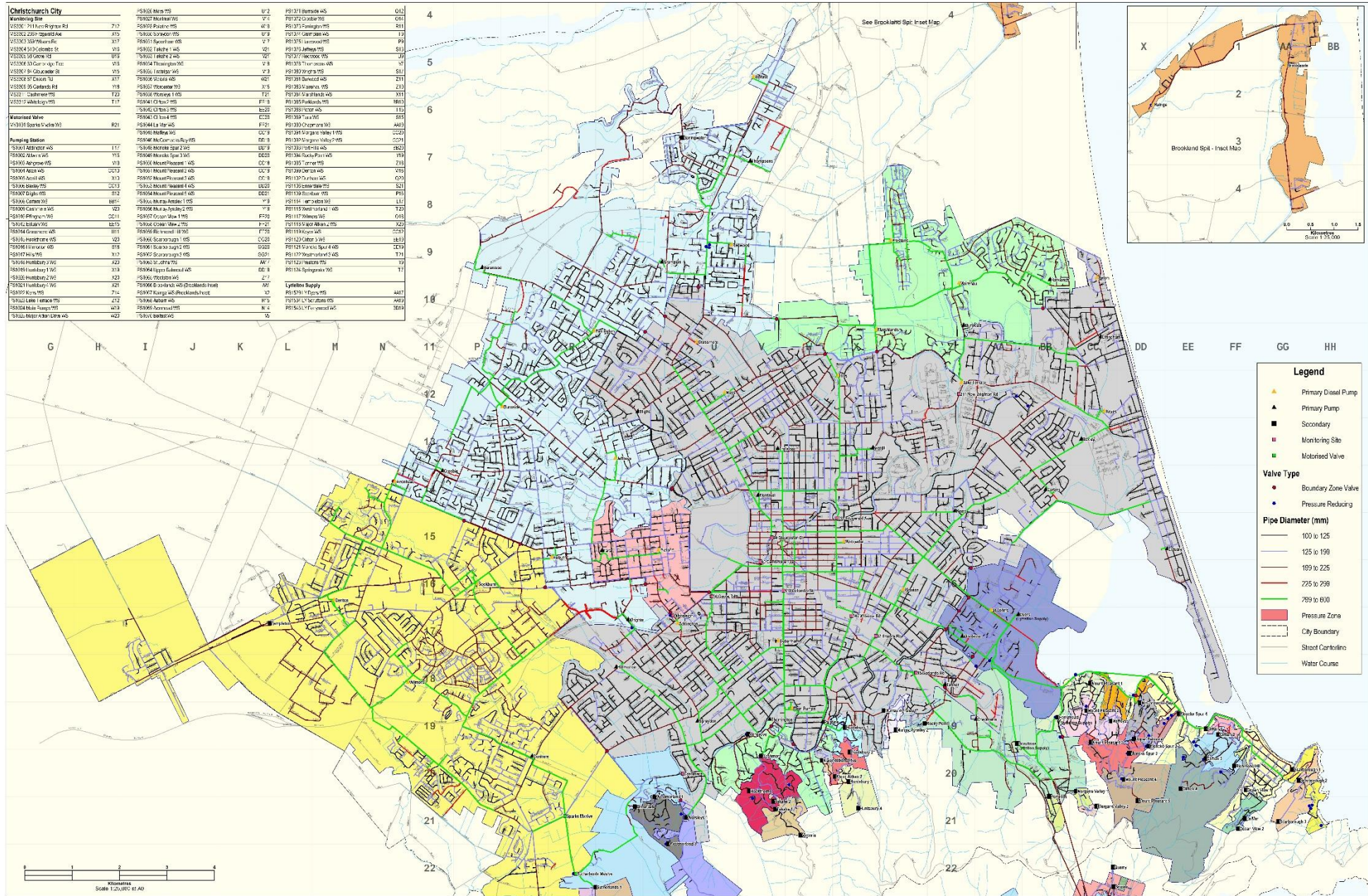
Table with columns A-J1 and rows 1538-1577. Contains alphanumeric codes like M36/5188, M36/5190, etc.



Large data table with multiple columns, including headers like 'Bore Depth (m)', 'Frequency', and various numerical values. It appears to be a detailed log or summary of data points.

Data Visualisation for Improved Understanding of Large Water Quality Datasets

LISA MACE (BECA)



Christchurch City	IS102 Mares MS	U72	PS1311 Bernside WS	012
Wairarapa St	7S102 Mares MS	U71	PS1312 Coleridge MS	014
4533C 7th March Bygon Rd	4533C 7th March MS	W69	PS1313 Fanning MS	016
4533C 22nd August Ave	7S103 Mares MS	U73	PS1314 Carr Hill MS	133
4533C 383 Phillips St	4533C 383 Phillips MS	U77	PS1315 Levea MS	019
4533C 433 Coleridge St	4533C 433 Coleridge MS	U26	PS1316 Jaffra MS	012
4533C 507 South St	7S104 Mares MS	U28	PS1317 Haddock MS	147
4533C 53 Curon Rd	7S105 Mares MS	U78	PS1318 Curon MS	021
4533C 1st Coleridge St	4533C 1st Coleridge MS	U73	PS1319 Fanning MS	016
4533C 1st Church St	7S106 Mares MS	U27	PS1320 Berrymore MS	211
4533C 2nd Coleridge Rd	4533C 2nd Coleridge MS	U75	PS1321 Valerius MS	213
4533C 1st Chalmers MS	7S107 Mares MS	U27	PS1322 Valerius MS	213
4533C 1st Chalmers MS	7S108 Mares MS	U73	PS1323 Valerius MS	213
4533C 1st Chalmers MS	7S109 Mares MS	U73	PS1324 Valerius MS	213
4533C 1st Chalmers MS	7S110 Mares MS	U73	PS1325 Valerius MS	213
4533C 1st Chalmers MS	7S111 Mares MS	U73	PS1326 Valerius MS	213
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4533C 1st Chalmers MS	7S115 Mares MS	U73	PS1330 Valerius MS	213
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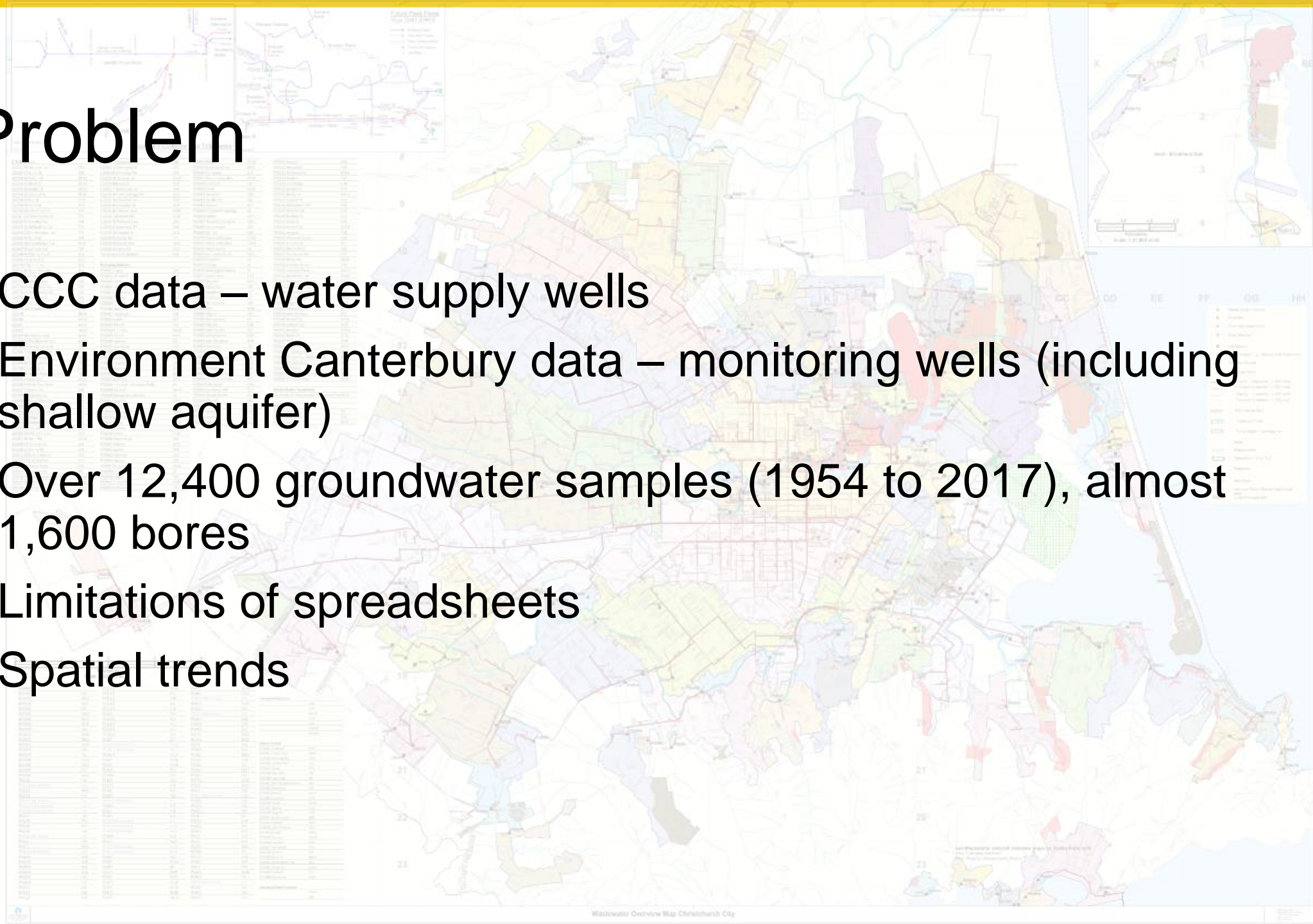
CCC Water Supply



- Groundwater, 5 aquifers under the city
- 139 wells, 53 pump stations
- Generally old water
- Normally no treatment
- Concern about increasing contaminants

Problem

- CCC data – water supply wells
- Environment Canterbury data – monitoring wells (including shallow aquifer)
- Over 12,400 groundwater samples (1954 to 2017), almost 1,600 bores
- Limitations of spreadsheets
- Spatial trends



Methodology

- Data consolidation
- Key water quality parameters
 - Escherichia coli (E. coli)
 - Total coliforms
 - Nitrate nitrogen
 - Ammonia nitrogen
 - Chloride
 - Dissolved reactive phosphorous (DRP)
- Microsoft Power BI

Solution

- A tool that allows you to spatially see trends in water quality throughout Canterbury

See Data

Show next level Drill up

Expand next level Drill down Drillthrough See Records

Data actions

Group Groups

Contaminant Levels for Chloride



- Parameter
- Ammonia Nitrogen
 - Chloride
 - Dissolved Reactive Ph...
 - E. Coli
 - Nitrate Nitrogen
 - Total Coliforms

Units

mg/L

Number of Recorded Samples

266

Date

18/01/1954 20/06/2017



Filters

- Filters on this visual
- Date - Quarter is (All)
 - Date - Year is (All)
 - Average of Value is (All)
 - GV is (All)
 - MAV is (All)
 - Parameter is (All)
 - Priority 2 is (All)
- Add data fields here

Filters on this page

- Add data fields here

Filters on all pages

- Parameter is (All)
- Add data fields here

Visualizations

Shared axis

- Date
- Year
- Quarter

Column series

- Parameter

Column values

- Average of Value

Line values

- GV
- MAV
- Priority 2

Visualizations

Tooltips

Add data fields here

Drillthrough

Cross-report

Off

Keep all filters

On

Add drillthrough fields here

Fields

- Search
- CombinedWaterData
 - Date
 - Date_Year
 - Field_Name
 - Parameter
 - ParameterID
 - POINT_X
 - POINT_Y
 - ProjectID or S...
 - Pump Station
 - Pump Station ...
 - SampleID
 - Site_East
 - Site_ID
 - Site_North
 - Status
 - SubGroup
 - TIME
 - TitleParameter
 - Units
 - Value
 - Sheet1
 - GV
 - MAV
 - Parameter
 - Priority 2
 - Sheet2
 - Parameter

Extensions of the Tool

- Depth of bore/aquifer
- Bore type (water supply or monitoring)
- Land use changes over time
- Relationship between parameters
- Highlight areas of concern
- Addition of data from neighbouring councils
- Continuous update from Water Outlook

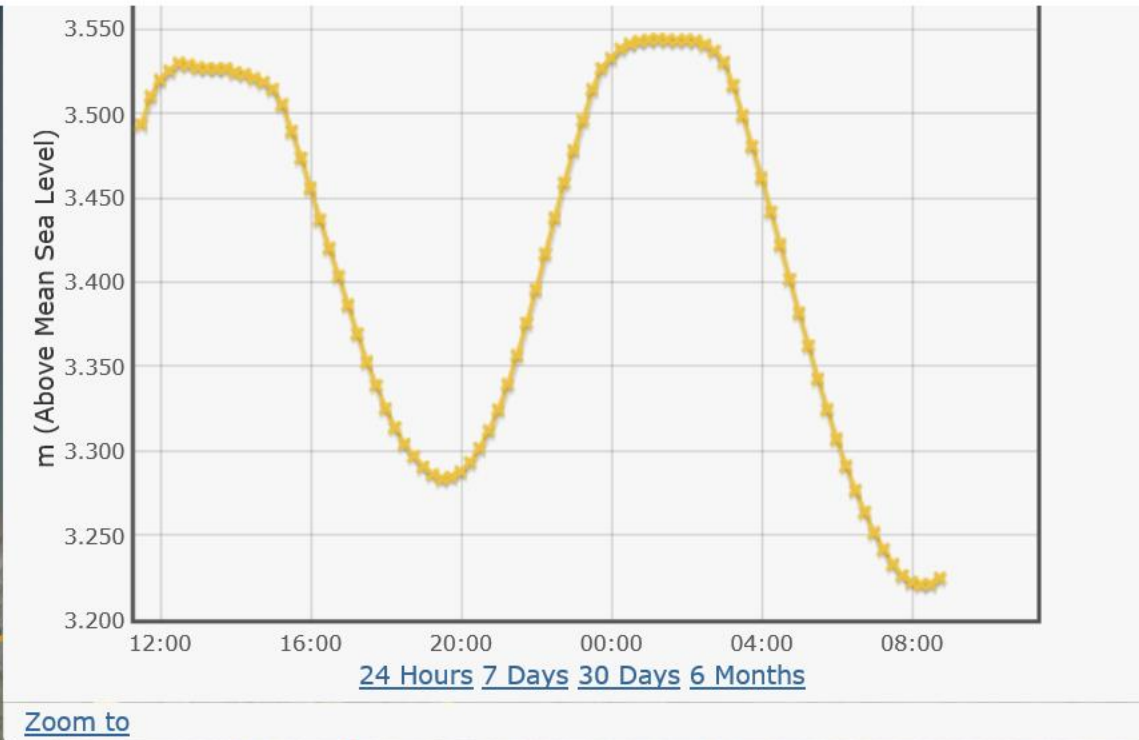
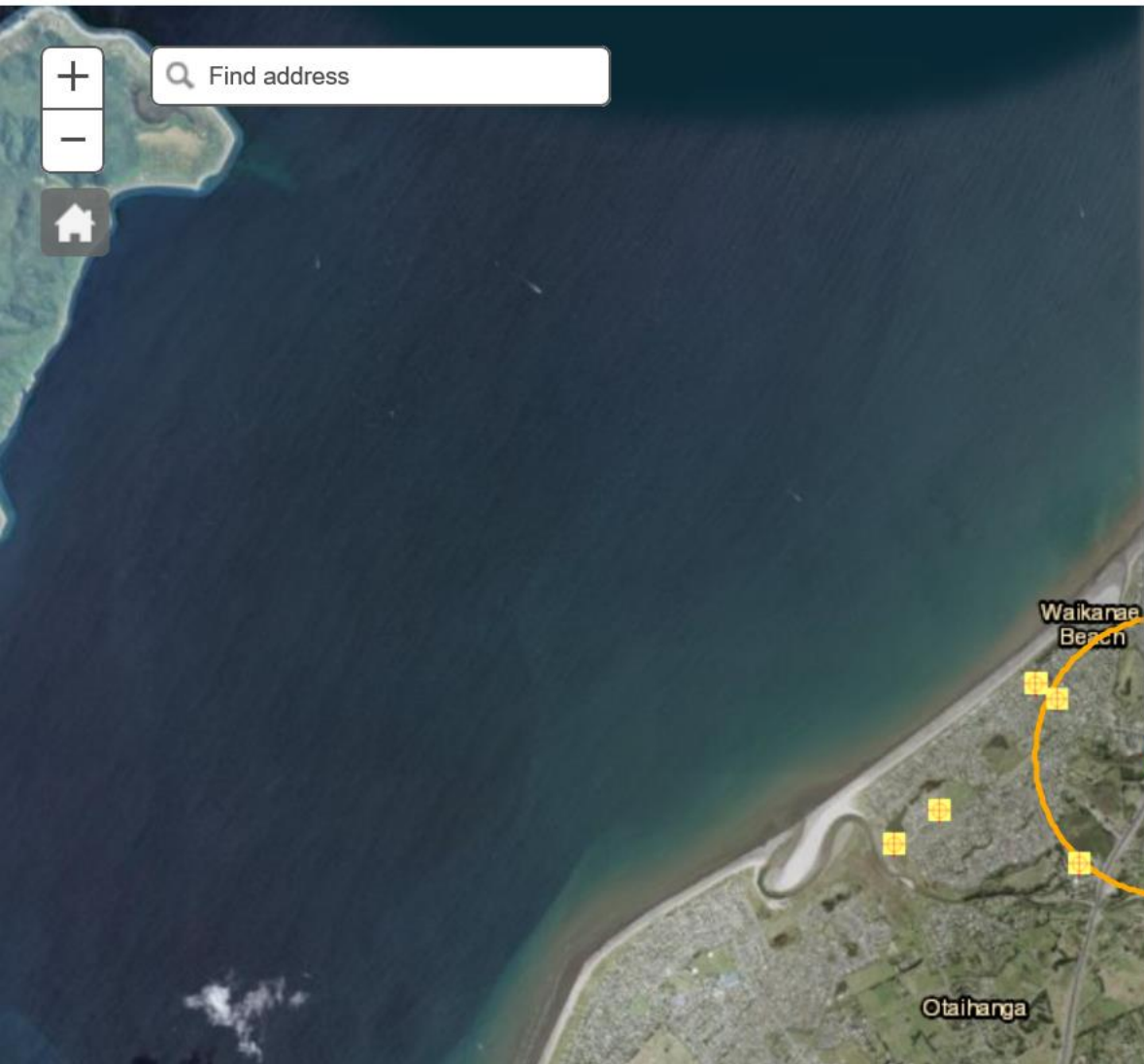
Other Applications

- Bore level tracking

Waikanae Borefield Level Monitoring

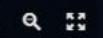
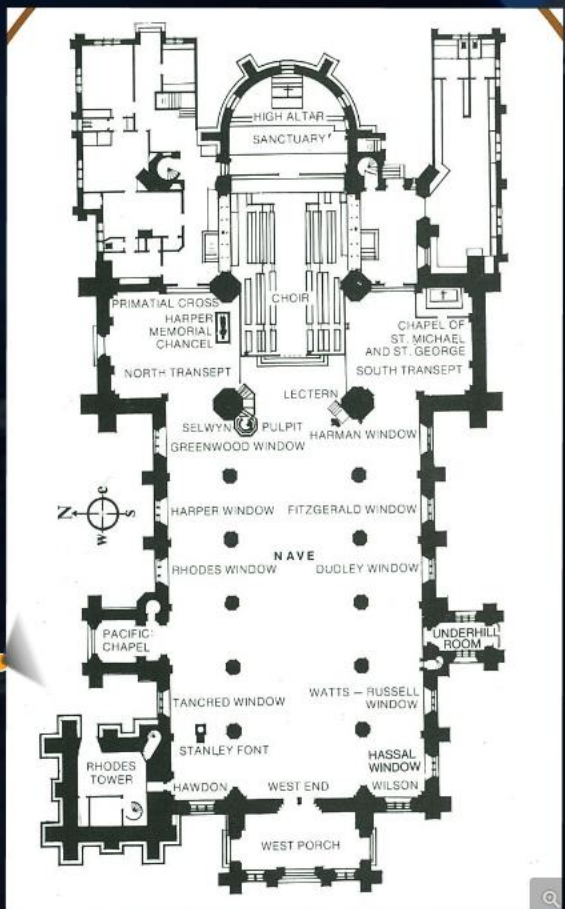
[Show Legend...](#)

[Contact Us...](#)



Other Applications

- Bore level tracking
- Spatial viewing of photos



Lower Level ^

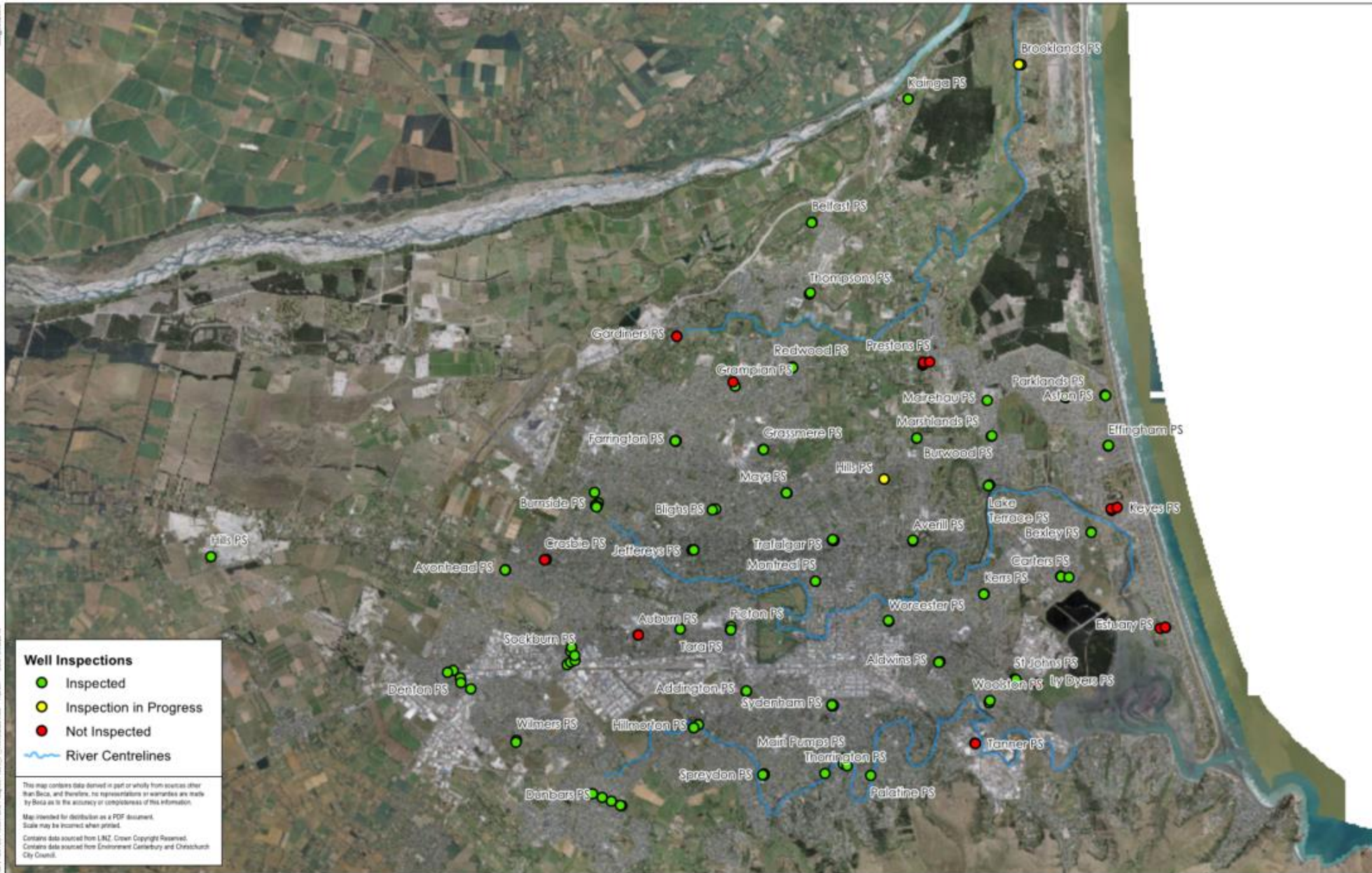
Layout



Other Applications

- Bore level tracking
- Spatial viewing of photos
- Inspection scheduling

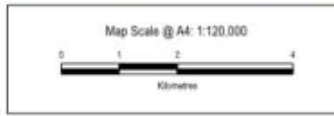
File: P:\6514856\GIS\Map6514856_01_Wellhead.mxd Author: Date: 16/03/18



Well Inspections

- Inspected
- Inspection in Progress
- Not Inspected
- River Centrelines

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 Scale may be incorrect when printed.
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 Contains data sourced from Environment Canterbury and Christchurch City Council.



Revision	Author	Verified	Approved	Date	Title
1	BCV	BP	BP	16/03/18	

Wellhead Inspections

Client: Christchurch City Council
 Project: Wellhead Review



Discipline: GIS
 Drawing No: GIS-6514856-01

Other Applications

- Bore level tracking
- Spatial viewing of photos
- Inspection scheduling
- Predictive maintenance
- Electricity usage monitoring
- Community information/education



Bin Collection



MTB Tracks



Bin sensors



Drinking fountains



Fire incidents



Free WiFi



Power Outages



Public toilets



Street Art



River level



Water quality



Chlorination



Water use



Air quality



UV Index



Fire risk



Earthquake



Wind



Tides



Sunset Sunrise



Weather

Cycling sentiment

Bus stops

Cycle counters



Cycle routes



Cycling Heat Map



Traffic



Closed roads



Road works



Flights

Questions and Ideas for Other Applications

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