

Measured GCP's Aral Sea Region (Kyzylorda region, Kazakhstan)

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To collect data, we used precision instrument the **Leica Zeno 20**

- With Zeno 20's straightforward and intuitive design, training is no longer necessary;
- Multiple feature sharing the same location can be measured with one observation;
- Map interaction using the Zeno Mobile is as simple and intuitive as using a smart phone;
- The out-of-the-box experience lets you flexibly start your field projects collecting the data you need;
- Manage and improve your data quality. As accurate as you need it – from meter to centimetre;
- One-click access to professional, high-quality imagery with the embedded Hexagon Imagery Program;
- Zeno Mobile is backed up by Zeno Office and works with a wide selection of GIS systems, gamtec supported data collection workflows;

For more information about [equipment](#)





To to get GCP go to the link <https://cloud.mail.ru/public/3XXe/ovCiJNzek>

To convert coordinates use the links below:

http://www.engineeringtoolbox.com/latitude-longitude-d_1371.html

<http://www.movable-type.co.uk/scripts/latlong-utm-mgrs.html>

Measured GCP's Aral Sea Region (Kyzylorda region, Kazakhstan)

	<p><u>Feature:</u> Hotel (cottage)</p> <p><u>Location:</u> 1/b, Takei Esetov str., Aral/Aralsk, Kyzylorda region, Kazakhstan</p> <p><u>Coordinates:</u></p> <table border="1"><thead><tr><th colspan="3">UTM</th></tr><tr><th>X</th><th>Y</th><th>Z</th></tr></thead><tbody><tr><td>397972.623</td><td>5183377.066</td><td>17,097</td></tr><tr><th colspan="3">WGS84 geographic</th></tr><tr><th>Lat</th><th>Long</th><th>Height</th></tr><tr><td>46°47'46.07220"</td><td>61°39'47,43242"</td><td>17,097</td></tr></tbody></table> <p>Date: 16/06/2016 Time: 19:06:10 Image1</p>	UTM			X	Y	Z	397972.623	5183377.066	17,097	WGS84 geographic			Lat	Long	Height	46°47'46.07220"	61°39'47,43242"	17,097
UTM																			
X	Y	Z																	
397972.623	5183377.066	17,097																	
WGS84 geographic																			
Lat	Long	Height																	
46°47'46.07220"	61°39'47,43242"	17,097																	
	<p><u>Feature:</u> a shed (next to the cottage)</p> <p><u>Location:</u> 1/b, Takei Esetov str., Aral/Aralsk, Kyzylorda region, Kazakhstan</p> <p><u>Coordinates:</u></p> <table border="1"><thead><tr><th colspan="3">UTM</th></tr><tr><th>X</th><th>Y</th><th>Z</th></tr></thead><tbody><tr><td>397993.758</td><td>5183372.961</td><td>18,214</td></tr><tr><th colspan="3">WGS84 geographic</th></tr><tr><th>Lat</th><th>Long</th><th>Height</th></tr><tr><td>46°47'45,95088"</td><td>61°39'48,00073"</td><td>18,214</td></tr></tbody></table> <p>Date: 16/06/2016 Time: 19:21:52 Image2</p>	UTM			X	Y	Z	397993.758	5183372.961	18,214	WGS84 geographic			Lat	Long	Height	46°47'45,95088"	61°39'48,00073"	18,214
UTM																			
X	Y	Z																	
397993.758	5183372.961	18,214																	
WGS84 geographic																			
Lat	Long	Height																	
46°47'45,95088"	61°39'48,00073"	18,214																	

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<http://www.movable-type.co.uk/scripts/latlong-utm-mgrs.html>

Measured GCP's Aral Sea Region (Kyzylorda region, Kazakhstan)



Feature:
Corner of building

Location:
3, Takei Esetov str., Aral/Aralsk, Kyzylorda region,
Kazakhstan

Coordinates:

UTM		
X	Y	Z
398022.662	5183378.759	15,09
WGS84 geographic		
Lat	Long	Height
46°47'46,15459"	61°39'49,35851"	15,09

Date: 16/06/2016

Time: 19:28:10

[Image3](#)



Feature:
House

Location:
Village Akespe

Coordinates:

UTM		
X	Y	Z
309659.550	5184558.133	56.30
WGS84 geographic		
Lat	Long	Height
46°47'14,6120"	60°30'22,2830"	56.30

Date: 18/06/2016

Time: 06:38:34

[Image4](#)

To to get GCP go to the link <https://cloud.mail.ru/public/3XXe/ovCiJNzek>

To convert coordinates use the links below:

http://www.engineeringtoolbox.com/latitude-longitude-d_1371.html

<http://www.movable-type.co.uk/scripts/latlong-utm-mgrs.html>

Measured GCP's Aral Sea Region (Kyzylorda region, Kazakhstan)



Feature:
Well with radon source

Location:
Nearby Akеспе village

Coordinates:

UTM		
X	Y	Z
310919.799	5184892.146	54,177
WGS84 geographic		
Lat	Long	Height
46°47'26,71326"	60°31'21,17143"	54,177

Date: 18/06/2016

Time: 07:52:50

[Image5](#)



Feature:
Water tower

Location:
Eski (old) Akеспе village

Coordinates:

UTM		
X	Y	Z
309659.549	5184558.125	56,309
WGS84 geographic		
Lat	Long	Height
46°47'14,61173"	60°30'22,28298"	56,309

Date: 18/06/2016

Time: 12:05:33

[Image6](#)


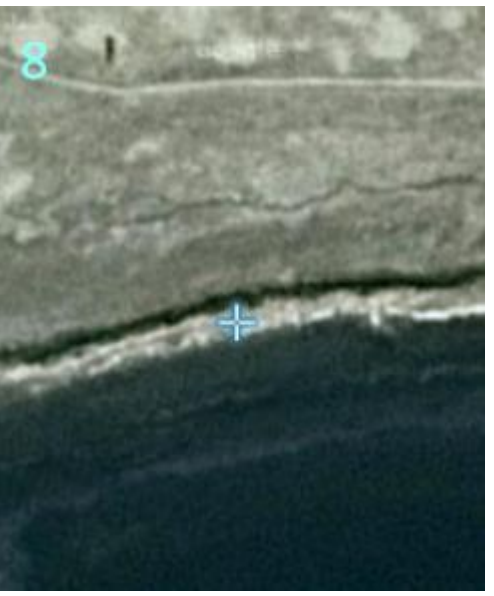
To to get GCP go to the link <https://cloud.mail.ru/public/3XXe/ovCiJNzek>

To convert coordinates use the links below:

http://www.engineeringtoolbox.com/latitude-longitude-d_1371.html

<http://www.movable-type.co.uk/scripts/latlong-utm-mgrs.html>

Measured GCP's Aral Sea Region (Kyzylorda region, Kazakhstan)

	<p><u>Feature:</u> Crossroads</p> <p><u>Location:</u> Eski (old) Akespe village</p> <p><u>Coordinates:</u></p> <table border="1"> <thead> <tr> <th colspan="3">UTM</th> </tr> <tr> <th>X</th> <th>Y</th> <th>Z</th> </tr> </thead> <tbody> <tr> <td>309615.008</td> <td>5184603.800</td> <td>56,89</td> </tr> <tr> <th colspan="3">WGS84 geographic</th> </tr> <tr> <th>Lat</th> <th>Long</th> <th>Height</th> </tr> <tr> <td>46°47'16,04429"</td> <td>60°30'20,11585"</td> <td>56,89</td> </tr> </tbody> </table> <p>Date: 18/06/2016 Time: 12:11:20 Image7</p>	UTM			X	Y	Z	309615.008	5184603.800	56,89	WGS84 geographic			Lat	Long	Height	46°47'16,04429"	60°30'20,11585"	56,89
UTM																			
X	Y	Z																	
309615.008	5184603.800	56,89																	
WGS84 geographic																			
Lat	Long	Height																	
46°47'16,04429"	60°30'20,11585"	56,89																	
	<p><u>Feature:</u> Water samples</p> <p><u>Location:</u> Butakova bay</p> <p><u>Coordinates:</u></p> <table border="1"> <thead> <tr> <th colspan="3">UTM</th> </tr> <tr> <th>X</th> <th>Y</th> <th>Z</th> </tr> </thead> <tbody> <tr> <td>312278.569</td> <td>5183265.053</td> <td>43,618</td> </tr> <tr> <th colspan="3">WGS84 geographic</th> </tr> <tr> <th>Lat</th> <th>Long</th> <th>Height</th> </tr> <tr> <td>60°32'27,60316"</td> <td>46°46'35,43122"</td> <td>43,618</td> </tr> </tbody> </table> <p>Date: 18/06/2016 Time: 13:31:42 Image8</p> <p>Note: there is no object just a place for water sample</p>	UTM			X	Y	Z	312278.569	5183265.053	43,618	WGS84 geographic			Lat	Long	Height	60°32'27,60316"	46°46'35,43122"	43,618
UTM																			
X	Y	Z																	
312278.569	5183265.053	43,618																	
WGS84 geographic																			
Lat	Long	Height																	
60°32'27,60316"	46°46'35,43122"	43,618																	

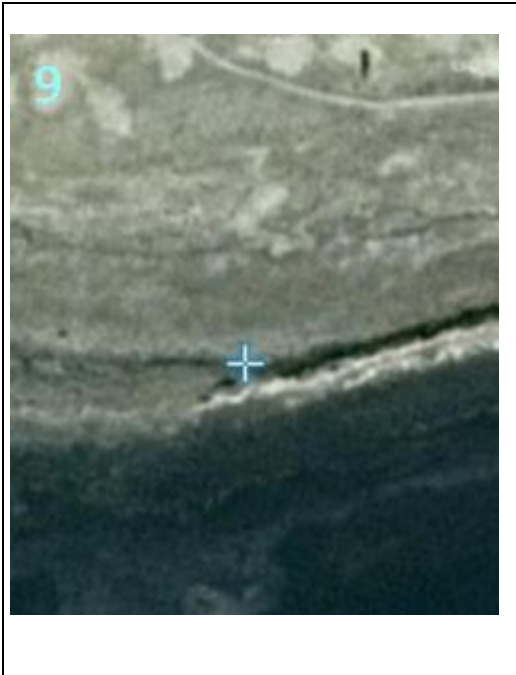
To to get GCP go to the link <https://cloud.mail.ru/public/3XXe/ovCiJNzek>

To convert coordinates use the links below:

http://www.engineeringtoolbox.com/latitude-longitude-d_1371.html

<http://www.movable-type.co.uk/scripts/latlong-utm-mgrs.html>

Measured GCP's Aral Sea Region (Kyzylorda region, Kazakhstan)



Feature:
Cane grass

Location:
Butakova bay

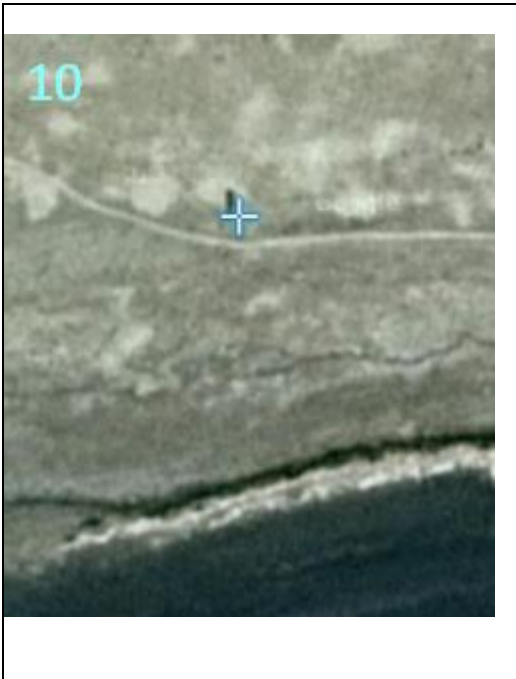
Coordinates:

UTM		
X	Y	Z
312109.312	5183228.320	42,636
WGS84 geographic		
Lat	Long	Height
46°46'34,07077"	60°32'19,68324"	42,636

Date: 18/06/2016

Time: 13:41:50

[Image9](#)



Feature:
Barge (ship)

Location:
(cost of) Butakova bay

Coordinates:

UTM		
X	Y	Z
312180.993	5183487.219	45,045
WGS84 geographic		
Lat	Long	Height
46°46'42,52320"	60°32'22,67840"	45,045

Date: 18/06/2016

Time: 13:49:08

[Image10](#)

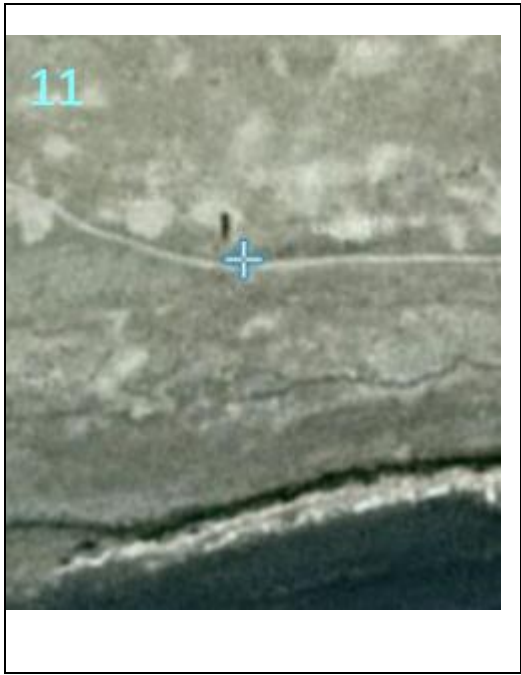

To to get GCP go to the link <https://cloud.mail.ru/public/3XXe/ovCiJNzek>

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<http://www.movable-type.co.uk/scripts/latlong-utm-mgrs.html>

Measured GCP's Aral Sea Region (Kyzylorda region, Kazakhstan)

	<p>Feature: Crossroads</p> <p>Location: (cost of) Butakova bay</p> <p>Coordinates:</p> <table border="1"> <thead> <tr> <th colspan="3">UTM</th> </tr> <tr> <th>X</th> <th>Y</th> <th>Z</th> </tr> </thead> <tbody> <tr> <td>312223.152</td> <td>5183465.367</td> <td>44,542</td> </tr> <tr> <th colspan="3">WGS84 geographic</th> </tr> <tr> <th>Lat</th> <th>Long</th> <th>Height</th> </tr> <tr> <td>46°46'41,85863"</td> <td>60°32'24,69692"</td> <td>44,542</td> </tr> </tbody> </table> <p>Date: 18/06/2016 Time: 13:52:29 Image11</p>	UTM			X	Y	Z	312223.152	5183465.367	44,542	WGS84 geographic			Lat	Long	Height	46°46'41,85863"	60°32'24,69692"	44,542
UTM																			
X	Y	Z																	
312223.152	5183465.367	44,542																	
WGS84 geographic																			
Lat	Long	Height																	
46°46'41,85863"	60°32'24,69692"	44,542																	
	<p>Feature: Water samples</p> <p>Location: Northern part of Shevchenko bay</p> <p>Coordinates:</p> <table border="1"> <thead> <tr> <th colspan="3">UTM</th> </tr> <tr> <th>X</th> <th>Y</th> <th>Z</th> </tr> </thead> <tbody> <tr> <td>293520.117</td> <td>5174656.924</td> <td>43,223</td> </tr> <tr> <th colspan="3">WGS84 geographic</th> </tr> <tr> <th>Lat</th> <th>Long</th> <th>Height</th> </tr> <tr> <td>46°41'36,91731"</td> <td>60°17'57,89538"</td> <td>43,223</td> </tr> </tbody> </table> <p>Date: 18/06/2016 Time: 15:42:34 Image12 Note: there is no object just a place for water sample</p>	UTM			X	Y	Z	293520.117	5174656.924	43,223	WGS84 geographic			Lat	Long	Height	46°41'36,91731"	60°17'57,89538"	43,223
UTM																			
X	Y	Z																	
293520.117	5174656.924	43,223																	
WGS84 geographic																			
Lat	Long	Height																	
46°41'36,91731"	60°17'57,89538"	43,223																	

To to get GCP go to the link <https://cloud.mail.ru/public/3XXe/ovCiJNzek>

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<http://www.movable-type.co.uk/scripts/latlong-utm-mgrs.html>

Measured GCP's Aral Sea Region (Kyzylorda region, Kazakhstan)



Feature:
Crossroads

Location:
North side of Shevchenko bay

Coordinates:

UTM		
X	Y	Z
289699.185	5176745.989	51.609
WGS84 geographic		
Lat	Long	Height
46°42'40,23574"	60°14'54,76014"	51.609

Date: 18/06/2016

Time: 17:10:33

[Image13](#)



Feature:
Wintering house

Location:
Beside the road to Akbasty,
south-western part of Shevchenko bay

Coordinates:

UTM		
X	Y	Z
723386.727	5143653.733	56.114
WGS84 geographic		
Lat	Long	Height
46°24'34,22657"	59°54'23,41773"	56.114

Date: 18/06/2016

Time: 20:38:11

[Image14](#)

To to get GCP go to the link <https://cloud.mail.ru/public/3XXe/ovCiJNzek>

To convert coordinates use the links below:

http://www.engineeringtoolbox.com/latitude-longitude-d_1371.html

<http://www.movable-type.co.uk/scripts/latlong-utm-mgrs.html>

Measured GCP's Aral Sea Region (Kyzylorda region, Kazakhstan)



Feature:
Barge

Location:
North-western part of Barsakelmes lake (Tushybas bay)

Coordinates:

UTM		
X	Y	Z
692086.679	5133371.382	41.72
WGS84 geographic		
Lat	Long	Height
46°19'36,04616"	59°29'43,67936"	41.72

Date: 19/06/2016

Time: 06:51:00

[Image15](#)



Feature:
Ship

Location:
West side of Barsakelmes lake (Tushybas bay)

Coordinates:

UTM		
X	Y	Z
692728.617	5129728.080	35.231
WGS84 geographic		
Lat	Long	Height
46°17'37,46183"	59°30'08,29378"	35.231

Date: 19/06/2016

Time: 07:42:44

[Image16](#)

To to get GCP go to the link <https://cloud.mail.ru/public/3XXe/ovCiJNzek>

To convert coordinates use the links below:

http://www.engineeringtoolbox.com/latitude-longitude-d_1371.html

<http://www.movable-type.co.uk/scripts/latlong-utm-mgrs.html>

Measured GCP's Aral Sea Region (Kyzylorda region, Kazakhstan)



Feature:
Barge

Location:
West side of Barsakelmes lake (Tushybas bay)

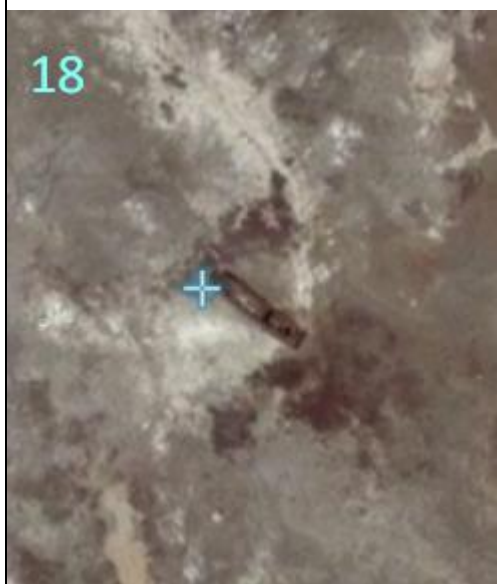
Coordinates:

UTM		
X	Y	Z
692908.238	5129778.918	35.196
WGS84 geographic		
Lat	Long	Height
46°17'38,92360"	59°30'16,75634"	35.196

Date: 19/06/2016
Time: 08:08:00

[Image17](#)

Note: they may not be there,
dismantled for spare parts [pic](#)



Feature:
Barge

Location:
West side of Barsakelmes lake (Tushybas Bay)

Coordinates:

UTM		
X	Y	Z
693674.672	5129689.466	32.617
WGS84 geographic		
Lat	Long	Height
46°17'35,24218"	59°30'52,41281"	32.617

Date: 19/06/2016
Time: 08:27:00

[Image18](#)

To to get GCP go to the link <https://cloud.mail.ru/public/3XXe/ovCiJNzek>

To convert coordinates use the links below:

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<http://www.movable-type.co.uk/scripts/latlong-utm-mgrs.html>

Measured GCP's Aral Sea Region (Kyzylorda region, Kazakhstan)



Feature:
ship

Location:
West side of Barsakelmes lake (Tushybas Bay)

Coordinates:

UTM		
X	Y	Z
691007.151	5130399.449	37.24
WGS84 geographic		
Lat	Long	Height
46°18'00,94595"	59°28'48,88970"	37.24

Date: 19/06/2016

Time: 09:31:00

[Image19](#)



Feature:
Mausoleum Sakhu

Location:
nearby Akbasty village

Coordinates:

UTM		
X	Y	Z
274840.174	5129633.170	59.259
WGS84 geographic		
Lat	Long	Height
46°16'58,44560"	60°04'37,86803"	59.259

Date: 19/06/2016

Time: 13:19:00

[Image20](#)

To to get GCP go to the link <https://cloud.mail.ru/public/3XXe/ovCiJNzek>

To convert coordinates use the links below:

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<http://www.movable-type.co.uk/scripts/latlong-utm-mgrs.html>

Measured GCP's Aral Sea Region (Kyzylorda region, Kazakhstan)



Feature:
Well with radon source

Location:
Akbasty village

Coordinates:

UTM		
X	Y	Z
276368.271	5126689.960	56.333
WGS84 geographic		
Lat	Long	Height
46°15'25,02744"	60°05'54,21646"	56.333

Date: 19/06/2016

Time: 14:25:25

[Image21](#)



Feature:
Mosque

Location:
Akbasty village

Coordinates:

UTM		
X	Y	Z
276355.065	5127583.783	60.276
WGS84 geographic		
Lat	Long	Height
46°15'53,93426"	60°05'52,07316"	60.276

Date: 19/06/2016

Time: 14:32:52

[Image22](#)

To to get GCP go to the link <https://cloud.mail.ru/public/3XXe/ovCiJNzek>

To convert coordinates use the links below:

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<http://www.movable-type.co.uk/scripts/latlong-utm-mgrs.html>

Measured GCP's Aral Sea Region (Kyzylorda region, Kazakhstan)



Feature:
Crossroads

Location:
Nearby Kokaral dam

Coordinates:

UTM		
X	Y	Z
325156.989	5111213.928	44.642
WGS84 geographic		
Lat	Long	Height
46°07'55,51573"	60°44'11,66886"	44.642

Date: 19/06/2016

Time: 17:12:56

[Image23](#)



Feature:
Bridge

Location:
Kokaral dam,
Reservoir of Kokaral

Coordinates:

UTM		
X	Y	Z
327612.461	5107778.150	44.176
WGS84 geographic		
Lat	Long	Height
46°06'06,52845"	60°46'10,50577"	44.176

Date: 19/06/2016

Time: 17:24:00

[Image24](#)

To to get GCP go to the link <https://cloud.mail.ru/public/3XXe/ovCiJNzek>

To convert coordinates use the links below:

http://www.engineeringtoolbox.com/latitude-longitude-d_1371.html

<http://www.movable-type.co.uk/scripts/latlong-utm-mgrs.html>

Measured GCP's Aral Sea Region (Kyzylorda region, Kazakhstan)



Feature:
Gas station

Location:
Karateren village

Coordinates:

UTM		
X	Y	Z
349329.626	5094478.538	55.843
WGS84 geographic		
Lat	Long	Height
45°59'14,34943"	61°03'16,55534"	55.843

Date: 20/06/2016

Time: 20:58:57

[Image25](#)

Note: You can see it in the fresh images



Feature:
Corner of house

Location:
Barsakelmes ex-island

Coordinates:

UTM		
X	Y	Z
727273.865	5062070.187	67.224
WGS84 geographic		
Lat	Long	Height
45°40'29,65112"	59°55'05,21430"	67.224

Date: 20/06/2016

Time: 07:39:36

[Image26](#)

To to get GCP go to the link <https://cloud.mail.ru/public/3XXe/ovCiJNzek>

To convert coordinates use the links below:

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<http://www.movable-type.co.uk/scripts/latlong-utm-mgrs.html>

Measured GCP's Aral Sea Region (Kyzylorda region, Kazakhstan)



Feature:
hydro meteorological post

Location:
Barsakelmes ex-island

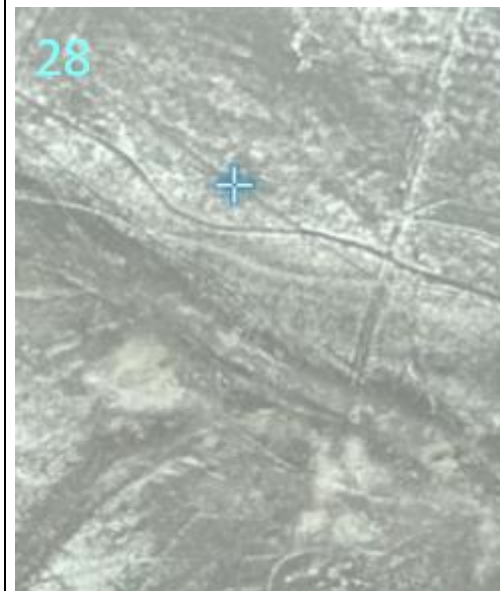
Coordinates:

UTM		
X	Y	Z
271653.833	5063043.948	83.875
WGS84 geographic		
Lat	Long	Height
45°40'59,89418"	60°04'03,63901"	83.875

Date: 20/06/2016

Time: 09:37:14

[Image27](#)



Feature:
Mausoleum Kerderi 2

Location:
nearby Barsa kelmes ex-island

Coordinates:

UTM		
X	Y	Z
286930.014	5067008.554	34.585
WGS84 geographic		
Lat	Long	Height
45°43'25,72584"	60°15'42,74217"	34.585

Date: 20/06/2016

Time: 10:48:00

[Image28](#)

To to get GCP go to the link <https://cloud.mail.ru/public/3XXe/ovCiJNzek>

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<http://www.movable-type.co.uk/scripts/latlong-utm-mgrs.html>

Measured GCP's Aral Sea Region (Kyzylorda region, Kazakhstan)



Feature:
Kerderi tawn 1

Location:
nearby Barsa kelmes ex-island

Coordinates:

UTM		
X	Y	Z
291059.383	5065344.500	34.026
WGS84 geographic		
Lat	Long	Height
45°42'36,39732"	60°18'56,14660"	34.026

Date: 20/06/2016

Time: 11:06:37

[Image29](#)



Feature:
Airport Korkyt Ata

Location:
Kysylorda airport

Coordinates:

UTM		
X	Y	Z
705368.920	4954260.451	0.42
WGS84 geographic		
Lat	Long	Height
44°42'44,24059"	65°35'33,88480"	0.42

Date: 21/06/2016

Time: 05:30:37

Please, do not hesitate to contact us, if You have any questions.

Dept. of Civil Engineering, School of Engineering, Nazarbayev University

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To to get GCP go to the link <https://cloud.mail.ru/public/3XXe/ovCiJNzek>

To convert coordinates use the links below:

http://www.engineeringtoolbox.com/latitude-longitude-d_1371.html

<http://www.movable-type.co.uk/scripts/latlong-utm-mgrs.html>