THIN SECTION LABEL ID: 369-U1512A-5R-4-W 72/75-TSB-TS1
Thin section no.: 1
Observer: CW
Unit/subunit: II-a

Thin section summary:
A silty clay with moderately developed lamination and rare burrows. The sediment sample is moderately sorted and is comprised of silt-sized angular mineral grains including common quartz and trace amounts of feldspar hosted within a clay-rich matrix. Rare grains are sand sized. Other minerals/bioclasts present in common and trace amounts include muscovite mica, biotite mica, tubular bioclast fragments and poorly developed/fragmented radiolarians.

Plane-polarized: 43920161  Cross-polarized: 43920141

Sediments and Sedimentary Rock

Complete Lithology Name: silty clay
Remarks:

<table>
<thead>
<tr>
<th>GRAIN SIZE</th>
<th>Gravel</th>
<th>Sand</th>
<th>Silt</th>
<th>Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
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<td>25</td>
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</table>

<table>
<thead>
<tr>
<th>COMPOSITION</th>
<th>Siliciclastic</th>
<th>Calcareous</th>
<th>Biosiliceous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral grains (%)</td>
<td>94</td>
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<td>1</td>
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<tr>
<td>Cement (%)</td>
<td>94</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>MINERAL GRAIN ROUNDNESS</th>
<th>MINERAL GRAIN SORTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>angular</td>
<td>moderate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mineral grain</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz</td>
<td>C</td>
</tr>
<tr>
<td>Microcline feldspar</td>
<td>T</td>
</tr>
<tr>
<td>Clay</td>
<td>D</td>
</tr>
<tr>
<td>Calcite</td>
<td>R</td>
</tr>
</tbody>
</table>

D=dominant, A=abundant, C=common, R=rare, T=trace
THIN SECTION LABEL ID 369-U1512A-13R-5-W 26/29-TSB-TS2
Observer: CW
Thin section no.: 2
Unit/subunit: II-b
Thin section summary: A possible sideritic siltstone, with quartz, glauconite, and Fe-oxide. The rock sample is moderately sorted and is comprised of silt-sized siderite grains hosted within a clay-rich matrix. Silt-sized quartz grains are common throughout. Pore spaces are also comprised of quartz cements. The rock sample is likely reworked from a proximal source area on the slope due to the angularity of the grains.

Sediments and Sedimentary Rock

Complete Lithology Name: siderite siltstone

Remarks: The dominant component of this rock could not be identified with confidence. It is most likely a ferrous carbonate mineral (siderite) due to its crystal shape and possible 3rd to 4th order birefringence colors. It is unlikely to be quartz as it does not exhibit undulose extinction or high to moderate relief. Crystals appear angular and do not interlock suggesting it has been reworked from elsewhere.

<table>
<thead>
<tr>
<th>GRAIN SIZE</th>
<th>Gravel</th>
<th>Sand</th>
<th>Silt</th>
<th>Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
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<td>0</td>
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<td>10</td>
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<table>
<thead>
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<th>COMPOSITION</th>
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<th>Calcareous</th>
<th>Biosiliceous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral grains (%)</td>
<td>1</td>
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<td>0</td>
</tr>
<tr>
<td>Cement (%)</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MINERAL GRAIN ROUNDEDNESS</th>
<th>MINERAL GRAIN SORTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>subangular</td>
<td>moderate</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Mineral grain</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz</td>
<td>R</td>
</tr>
<tr>
<td>Clay</td>
<td>R</td>
</tr>
<tr>
<td>Calcite</td>
<td>T</td>
</tr>
<tr>
<td>Siderite</td>
<td>D</td>
</tr>
</tbody>
</table>

D=dominant, A=abundant, C=common, R=rare, T=trace
THIN SECTION LABEL ID: 369-U1512A-20R-7-W 55/58-TSB-TS3
Thin section no.: 3
Observer: CW
Unit/subunit: II-b

Thin section summary: A possible fine grained sideritic sandstone with traces of glauconite, quartz, and Fe-oxide/hydroxide minerals. The rock sample is moderately sorted and is comprised of possible sand-sized siderite grains hosted within a clay-rich matrix. Pore spaces comprise quartz cements. Silt-sized quartz grains are common throughout. Poorly preserved/fragmented radiolarian grains are present in trace amounts. The rock sample is likely reworked from a proximal source area on the slope due angularity of the grains.

Plane-polarized: 43919991
Cross-polarized: 43920011

Sediments and Sedimentary Rock

Complete Lithology Name: siderite sandstone

Remarks: The dominant component of this rock could not be identified with confidence. It is most likely a ferrous carbonate (siderite) due to its crystal shape and possible 3rd to 4th order birefringence colors. It is unlikely to be quartz as it does not exhibit undulose extinction or high to moderate relief. Crystals appear angular and do not interlock suggesting it has been reworked from elsewhere.

<table>
<thead>
<tr>
<th>GRAIN SIZE</th>
<th>Gravel</th>
<th>Sand</th>
<th>Silt</th>
<th>Clay</th>
</tr>
</thead>
<tbody>
<tr>
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<td>5</td>
<td>35</td>
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<table>
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<th>Biosiliceous</th>
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</thead>
<tbody>
<tr>
<td>Mineral grains (%)</td>
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<td>1</td>
</tr>
<tr>
<td>Cement (%)</td>
<td>1</td>
<td>0</td>
<td>1</td>
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MINERAL GRAIN ROUNDEDNESS: subangular
MINERAL GRAIN SORTING: well

<table>
<thead>
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<td>Quartz</td>
<td>R</td>
</tr>
<tr>
<td>Clay</td>
<td>R</td>
</tr>
<tr>
<td>Siderite</td>
<td>D</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Biogenic material</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiolarians</td>
<td>T</td>
</tr>
</tbody>
</table>

D=dominant, A=abundant, C=common, R=rare, T=trace
THIN SECTION LABEL ID: 369-U1512A-22R-5-W 46/48-TSB-TS4
Observer: CW
Unit/subunit: II-b
Thin section no.: 4
Thin section summary: A medium grained glauconitic sandstone. The rock sample is moderately sorted and is comprised of abundant glauconite, mica, and common sand-sized quartz grains with traces of muscovite, chlorite and lithic fragments (quartzite? and claystone with radiolarians). Some pore spaces are infilled with clay minerals. Organic matter and common opaque anhedral minerals are present in trace amounts. The rock sample is likely reworked from a proximal source area on the slope due to the angularity of the grains.

Sediments and Sedimentary Rock
Complete Lithology Name: glauconitic sandstone with siderite
Remarks:

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<th>Silt</th>
<th>Clay</th>
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<tr>
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<th>Biosiliceous</th>
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<tbody>
<tr>
<td>Mineral grains (%)</td>
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<tr>
<td>Cement (%)</td>
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<td>1</td>
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<table>
<thead>
<tr>
<th>MINERAL GRAIN ROUNDNESS</th>
<th>MINERAL GRAIN SORTING</th>
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</thead>
<tbody>
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<table>
<thead>
<tr>
<th>Mineral grain</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz</td>
<td>A</td>
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<tr>
<td>Muscovite mica</td>
<td>T</td>
</tr>
<tr>
<td>Chlorite</td>
<td>T</td>
</tr>
<tr>
<td>Clay</td>
<td>C</td>
</tr>
<tr>
<td>Glauconite</td>
<td>D</td>
</tr>
<tr>
<td>Siderite</td>
<td>R</td>
</tr>
<tr>
<td>Lithic fragments</td>
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<tr>
<td>Other mineral grains</td>
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</tr>
<tr>
<td>Biogenic material</td>
<td>Abundance</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Plant material</td>
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</tr>
<tr>
<td>Radiolarians</td>
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</tbody>
</table>

D=dominant, A=abundant, C=common, R=rare, T=trace
THIN SECTION LABEL ID 369-U1512A-22R-7-W 40/42-TSB_MAD-TS5  Thin section no.: 5
Observer: CW  Unit/subunit: II-b
Thin section summary: A fine grained glauconitic sandstone. The rock sample is moderately sorted and is comprised of abundant glauconite, mica, and common angular sand-sized quartz grains with traces of muscovite, biotite mica and lithic fragments (quartzite?). Some pore spaces are infilled with clay minerals. The rock sample is likely reworked from a proximal source area on the slope due to the angularity of the grains.

Plane-polarized: 43919881  Cross-polarized: 43919901

Sediments and Sedimentary Rock

Complete Lithology Name: glauconitic sandstone with siderite

Remarks:

<table>
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<tr>
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<th>Sand</th>
<th>Silt</th>
<th>Clay</th>
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</thead>
<tbody>
<tr>
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<td>85</td>
<td>5</td>
<td>10</td>
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</table>

<table>
<thead>
<tr>
<th>COMPOSITION</th>
<th>Siliciclastic</th>
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<th>Biosiliceous</th>
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</thead>
<tbody>
<tr>
<td>Mineral grains (%)</td>
<td>97</td>
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<tr>
<td>Cement (%)</td>
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<table>
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<tr>
<th>MINERAL GRAIN ROUNDEDNESS</th>
<th>MINERAL GRAIN SORTING</th>
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<tbody>
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<td>angular</td>
<td>moderate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mineral grain</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz</td>
<td>A</td>
</tr>
<tr>
<td>Biotite mica</td>
<td>T</td>
</tr>
<tr>
<td>Clay</td>
<td>C</td>
</tr>
<tr>
<td>Glauconite</td>
<td>D</td>
</tr>
</tbody>
</table>

D=dominant, A=abundant, C=common, R=rare, T=trace
A fine to medium grained siderite sandstone with glauconite grains. The sediment sample is poorly sorted and is comprised of common sand-sized subangular quartz grains and abundant glauconite and mica. The rock sample also comprises trace amounts of K-feldspar, muscovite mica and chlorite. Some pore spaces are infilled with clay minerals; however, the sandstone is cemented with siderite. The rock sample is likely reworked from a proximal source area on the slope due to the angularity of the grains.

**Sediments and Sedimentary Rock**

**Complete Lithology Name:** glauconitic sandstone with siderite

**Remarks:**

<table>
<thead>
<tr>
<th>GRAIN SIZE</th>
<th>Gravel</th>
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<th>Silt</th>
<th>Clay</th>
</tr>
</thead>
<tbody>
<tr>
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<table>
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<th>Biosiliceous</th>
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</thead>
<tbody>
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<tr>
<td>Cement (%)</td>
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<td>0</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>MINERAL GRAIN ROUNDNESS</th>
<th>MINERAL GRAIN SORTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>subangular</td>
<td>moderate</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Mineral grain</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz</td>
<td>A</td>
</tr>
<tr>
<td>Microcline feldspar</td>
<td>T</td>
</tr>
<tr>
<td>Muscovite mica</td>
<td>T</td>
</tr>
<tr>
<td>Chlorite</td>
<td>T</td>
</tr>
<tr>
<td>Clay</td>
<td>R</td>
</tr>
<tr>
<td>Glauconite</td>
<td>A</td>
</tr>
</tbody>
</table>

D=dominant, A=abundant, C=common, R=rare, T=trace
Thin section summary:

A possible fine grained sideritic sandstone with common Fe-oxide/hydroxide minerals and traces of quartz. The rock sample is moderately sorted and is comprised of sand-sized siderite grains hosted within a clay-rich matrix. Pore spaces may comprise quartz cements. Silt-sized quartz grains are common throughout. The rock sample is likely reworked from a proximal source area on the slope due angularity of the grains.

Sediments and Sedimentary Rock

**Complete Lithology Name:** siderite sandstone

The dominant component of this rock sample could not be identified with confidence. It is most likely a ferrous carbonate (siderite) due to its crystal shape and possible 3rd to 4th order birefringence colors. It is unlikely to be quartz as it does not exhibit undulose extinction or high to moderate relief. Crystals appear angular and do not interlock suggesting it has been reworked from elsewhere.

<table>
<thead>
<tr>
<th>GRAIN SIZE</th>
<th>Gravel</th>
<th>Sand</th>
<th>Silt</th>
<th>Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>0</td>
<td>65</td>
<td>30</td>
<td>5</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>COMPOSITION</th>
<th>Siliciclastic</th>
<th>Calcareous</th>
<th>Biosiliceous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral grains (%)</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Cement (%)</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MINERAL GRAIN ROUNDNESS</th>
<th>MINERAL GRAIN SORTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>subangular</td>
<td>moderate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mineral grain</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz</td>
<td>R</td>
</tr>
<tr>
<td>Clay</td>
<td>R</td>
</tr>
<tr>
<td>Siderite</td>
<td>D</td>
</tr>
</tbody>
</table>

D=dominant, A=abundant, C=common, R=rare, T=trace
A silty claystone with moderately developed lamination. The rock sample is moderately sorted and is comprised of silt-sized subangular mineral grains commonly quartz within a clay-rich matrix. Rare grains are sand sized. Other minerals/bioclasts present in common and trace amounts include glauconite and mica. Tubular burrows maybe present in the thin section.

**Sediments and Sedimentary Rock**

**Complete Lithology Name:** silty claystone  
**Remarks:**  

<table>
<thead>
<tr>
<th>GRAIN SIZE</th>
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<th>Biosiliceous</th>
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</thead>
<tbody>
<tr>
<td>Mineral grains (%)</td>
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<tr>
<td>Cement (%)</td>
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<table>
<thead>
<tr>
<th>MINERAL GRAIN ROUNDEDNESS</th>
<th>MINERAL GRAIN SORTING</th>
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</thead>
<tbody>
<tr>
<td>subangular</td>
<td>moderate</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Mineral grain</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz</td>
<td>C</td>
</tr>
<tr>
<td>Clay</td>
<td>D</td>
</tr>
<tr>
<td>Other mineral grains</td>
<td>C</td>
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</table>

D=dominant, A=abundant, C=common, R=rare, T=trace
THIN SECTION LABEL ID 369-U1512A-30R-4-W 61/64-TSB-TS9
Thin section no.: 9
Observer: CW
Unit/subunit: II-b
Thin section summary: A possible silt to fine grained siderite sandstone with rare grains of quartz and traces of clay minerals. The rock sample is moderately sorted and is comprised of silt and sand-sized siderite and quartz grains with pore spaces infilled with carbonate cement.

Plane-polarized: 43914211  Cross-polarized: 43914251

Sediments and Sedimentary Rock
Complete Lithology Name: siderite sandstone
The dominant component of this rock sample could not be identified with confidence. It is most likely a ferrous carbonate (siderite) due to its crystal shape and possible 3rd to 4th order birefringence colors. It is unlikely to be quartz as it does not exhibit undulose extinction or high to moderate relief. Crystals appear to interlock suggesting it is a diagenetic cement.

<table>
<thead>
<tr>
<th>GRAIN SIZE</th>
<th>Gravel</th>
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<th>Clay</th>
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<tbody>
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<th>Calcareous</th>
<th>Biosiliceous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral grains (%)</td>
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<td>1</td>
</tr>
<tr>
<td>Cement (%)</td>
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<td>1</td>
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</tbody>
</table>

MINERAL GRAIN ROUNDEDNESS | MINERAL GRAIN SORTING
subangular | moderate

<table>
<thead>
<tr>
<th>Mineral grain</th>
<th>Abundance</th>
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<tbody>
<tr>
<td>Quartz</td>
<td>T</td>
</tr>
<tr>
<td>Clay</td>
<td>T</td>
</tr>
<tr>
<td>Siderite</td>
<td>D</td>
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</tbody>
</table>

D=dominant, A=abundant, C=common, R=rare, T=trace
THIN SECTION LABEL ID 369-U1512A-32R-5-W 79/82-TSB-TS_10 Thin section no.: 10
Observer: CW Unit/subunit: Unit II-b
Thin section summary: A fine to medium grained glauconitic sandstone with siderite. The rock sample is moderately sorted and is comprised of abundant glauconite mica and common sand-sized subangular quartz with traces of foraminifera shell and sponge spicules. The sandstone is cemented with siderite with some pore spaces infilled with clay minerals. The rock sample is likely reworked from a proximal source area on the slope due to the angularity of the grains.

Plane-polarized: 43914151  Cross-polarized: 43914191

Sediments and Sedimentary Rock

Complete Lithology Name: glauconitic sandstone with siderite

Remarks:

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<th>Clay</th>
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<th>Calcareous</th>
<th>Biosiliceous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral grains (%)</td>
<td>90</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Cement (%)</td>
<td>90</td>
<td>0</td>
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</tbody>
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<table>
<thead>
<tr>
<th>MINERAL GRAIN ROUNDEDNESS</th>
<th>MINERAL GRAIN SORTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>subangular</td>
<td>poor</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Mineral grain</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz</td>
<td>A</td>
</tr>
<tr>
<td>Glauconite</td>
<td>D</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Biogenic material</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foraminifers</td>
<td>T</td>
</tr>
</tbody>
</table>

D=dominant, A=abundant, C=common, R=rare, T=trace
THIN SECTION LABEL ID: 369-U1512A-32R-5-W 83/86-TSB-TS11
Observer: CW
Thin section no.: 11
Unit/subunit: Unit II-b
Thin section summary: A fine to medium grained glauconitic sandstone with siderite. The rock sample is poorly sorted and is comprised of abundant rounded glauconite grains, sand-sized subangular quartz grains, common rounded siderite grains with trace amounts of mica. Some pore spaces are infilled with clay minerals. The rock sample is likely reworked from a proximal source area on the slope due to the angularity of the grains.

Sediments and Sedimentary Rock

Complete Lithology Name: glauconitic sandstone with siderite

Remarks:

<table>
<thead>
<tr>
<th>GRAIN SIZE</th>
<th>Gravel</th>
<th>Sand</th>
<th>Silt</th>
<th>Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>0</td>
<td>90</td>
<td>5</td>
<td>5</td>
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</tbody>
</table>

<table>
<thead>
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<th>Siliciclastic</th>
<th>Calcareous</th>
<th>Biosiliceous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral grains (%)</td>
<td>80</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Cement (%)</td>
<td>80</td>
<td>0</td>
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<table>
<thead>
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<th>MINERAL GRAIN ROUNDEDNESS</th>
<th>MINERAL GRAIN SORTING</th>
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</thead>
<tbody>
<tr>
<td>sub-rounded</td>
<td>poor</td>
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<table>
<thead>
<tr>
<th>Mineral grain</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz</td>
<td>A</td>
</tr>
<tr>
<td>Clay</td>
<td>T</td>
</tr>
<tr>
<td>Glauconite</td>
<td>D</td>
</tr>
</tbody>
</table>

D=dominant, A=abundant, C=common, R=rare, T=trace
THIN SECTION LABEL ID  369-U1512A-37R-1-W 69/71-TSB-TS12
Thin section no.: 12
Observer: CW
Unit/subunit: Unit II-b
Thin section summary: A silt-sized to fine grained crystalline siderite. The rock sample is comprised of dominant crystalline siderite, common clay with traces of quartz and radiolarians. Siderite present in this sample is likely to be diagenetic in origin because the majority of siderite crystals interlock with each other.

Plane-polarized: 43911861   Cross-polarized: 43911881

Sediments and Sedimentary Rock

Complete Lithology Name: siderite sandstone with clay
Remarks: Siderite crystals interlock. This suggests the siderite was diagenetic and formed in-situ.

<table>
<thead>
<tr>
<th>GRAIN SIZE</th>
<th>Gravel</th>
<th>Sand</th>
<th>Silt</th>
<th>Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
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<td>25</td>
<td>5</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>COMPOSITION</th>
<th>Siliciclastic</th>
<th>Calcareous</th>
<th>Biosiliceous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral grains (%)</td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Cement (%)</td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MINERAL GRAIN ROUNDEDNESS</th>
<th>MINERAL GRAIN SORTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>angular</td>
<td>well</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mineral grain</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz</td>
<td>T</td>
</tr>
<tr>
<td>Clay</td>
<td>C</td>
</tr>
<tr>
<td>Calcite</td>
<td>T</td>
</tr>
<tr>
<td>Siderite</td>
<td>D</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Biogenic material</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiolarians</td>
<td>T</td>
</tr>
</tbody>
</table>

D=dominant, A=abundant, C=common, R=rare, T=trace
THIN SECTION LABEL ID: 369-U1512A-37R-1-W 71/73-TSB-TS13
Observer: CW
Thin section no.: 13
Thin section summary: A very fine grained crystalline siderite. The rock sample is comprised of dominant crystalline siderite, common clay with traces of quartz and radiolarians. Siderite is present in this sample is likely to be diagenetic in origin because the majority of siderite crystals interlock with each other.

Sediments and Sedimentary Rock

Complete Lithology Name: siderite sandstone
Remarks: Siderite crystals interlock. This suggests the siderite was diagenetic and formed in-situ.

<table>
<thead>
<tr>
<th>GRAIN SIZE</th>
<th>Gravel</th>
<th>Sand</th>
<th>Silt</th>
<th>Clay</th>
</tr>
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<tbody>
<tr>
<td>Percent</td>
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<td>5</td>
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<th>Calcareous</th>
<th>Biosiliceous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral grains (%)</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>Cement (%)</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tbody>
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<table>
<thead>
<tr>
<th>MINERAL GRAIN ROUNDEDNESS</th>
<th>MINERAL GRAIN SORTING</th>
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</thead>
<tbody>
<tr>
<td>angular</td>
<td>well</td>
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</table>

<table>
<thead>
<tr>
<th>Mineral grain</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz</td>
<td>T</td>
</tr>
<tr>
<td>Clay</td>
<td>C</td>
</tr>
<tr>
<td>Siderite</td>
<td>D</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Biogenic material</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiolarians</td>
<td>T</td>
</tr>
</tbody>
</table>

D=dominant, A=abundant, C=common, R=rare, T=trace
THIN SECTION LABEL ID: 369-U1512A-50R-5-W 40/43-TSB-TS14

Observer: AM

Thin section summary: A silty claystone with moderately developed lamination. The rock sample is moderately sorted and is comprised of clay-sized subangular mineral grains commonly quartz within a clay-rich matrix. Rare grains are sand sized. Other minerals/bioclasts are present in common and trace amounts and include glauconite mica and biotite. Tubular burrows may be present in the thin section.

Plane-polarized: 44000901
Cross-polarized: 44000921

Sediments and Sedimentary Rock

Complete Lithology Name: silty claystone

Remarks:

<table>
<thead>
<tr>
<th>GRAIN SIZE</th>
<th>Gravel</th>
<th>Sand</th>
<th>Silt</th>
<th>Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
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<td>0</td>
<td>5</td>
<td>95</td>
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<thead>
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<th>Biosilicaceous</th>
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<tbody>
<tr>
<td>Mineral grains (%)</td>
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<td>Cement (%)</td>
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<table>
<thead>
<tr>
<th>MINERAL GRAIN ROUNDNESS</th>
<th>MINERAL GRAIN SORTING</th>
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<tbody>
<tr>
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<table>
<thead>
<tr>
<th>Mineral grain</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz</td>
<td>C</td>
</tr>
<tr>
<td>Biotite mica</td>
<td>T</td>
</tr>
<tr>
<td>Clay</td>
<td>D</td>
</tr>
<tr>
<td>Other mineral grains</td>
<td>C</td>
</tr>
</tbody>
</table>

D=dominant, A=abundant, C=common, R=rare, T=trace
369-U1512A-51R-1-W 48/51-TSB-TS15

Thin section no.: 15
Observer: MGT

Unit/subunit: Unit II-b

Thin section summary: Sideritic silty claystone, with quartz and Fe-oxide. The rock sample is moderately sorted and are comprised of burrows filled with laminated siderite and silt-sized siderite grains hosted within a clay-rich matrix. Silt-sized quartz grains are common throughout. Pore spaces and fractures comprises quartz cements.

Plane-polarized: 44000861
Cross-polarized: 44000881

Sediments and Sedimentary Rock

Complete Lithology Name: clayey siltstone with siderite

Remarks: "Worm's nest". Section contains a lot of trace fossils forming a network. Siderite crystals within clayey siltstone, both diagenetic and detrital. Siderite in burrows diagenetic, silt-sized siderite grains detrital

<table>
<thead>
<tr>
<th>GRAIN SIZE</th>
<th>Gravel</th>
<th>Sand</th>
<th>Silt</th>
<th>Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
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<td>0</td>
<td>80</td>
<td>20</td>
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<th>Biosiliceous</th>
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</thead>
<tbody>
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<td>Cement (%)</td>
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<table>
<thead>
<tr>
<th>MINERAL GRAIN ROUNDEDNESS</th>
<th>MINERAL GRAIN SORTING</th>
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</thead>
<tbody>
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<td>moderate</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Mineral grain</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz</td>
<td>R</td>
</tr>
<tr>
<td>Muscovite mica</td>
<td>T</td>
</tr>
<tr>
<td>Clay</td>
<td>A</td>
</tr>
<tr>
<td>Siderite</td>
<td>D</td>
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D=dominant, A=abundant, C=common, R=rare, T=trace
THIN SECTION LABEL ID: 369-U1512A-51R-5-W 43/46-TSB-TS16
Thin section no.: 16
Observer: AM
Unit/subunit: Unit II-b
Thin section summary: A silty claystone with moderately developed lamination. The rock sample is moderately sorted and are comprised of clay-sized subangular mineral grains commonly quartz within a clay-rich matrix. Other minerals/bioclasts are muscovite, siderite (silt-sized grains), mica (biotite) and sponge spicula. Tubular burrows maybe present in the thin section.

Plane-polarized: 44000821
Cross-polarized: 44000841

Sediments and Sedimentary Rock

Complete Lithology Name: silty claystone
Remarks:

<table>
<thead>
<tr>
<th>GRAIN SIZE</th>
<th>Gravel</th>
<th>Sand</th>
<th>Silt</th>
<th>Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
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<td>0</td>
<td>5</td>
<td>95</td>
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<table>
<thead>
<tr>
<th>COMPOSITION</th>
<th>Siliciclastic</th>
<th>Calcareous</th>
<th>Biosiliceous</th>
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</thead>
<tbody>
<tr>
<td>Mineral grains (%)</td>
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<td>0</td>
</tr>
<tr>
<td>Cement (%)</td>
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<td>5</td>
<td>0</td>
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<table>
<thead>
<tr>
<th>MINERAL GRAIN ROUNDEDNESS</th>
<th>MINERAL GRAIN SORTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>subangular</td>
<td>moderate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mineral grain</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz</td>
<td>C</td>
</tr>
<tr>
<td>Muscovite mica</td>
<td>T</td>
</tr>
<tr>
<td>Biotite mica</td>
<td>T</td>
</tr>
<tr>
<td>Clay</td>
<td>D</td>
</tr>
<tr>
<td>Siderite</td>
<td>T</td>
</tr>
<tr>
<td>Other mineral grains</td>
<td>C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Biogenic material</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sponge spicules</td>
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</tr>
</tbody>
</table>

D=dominant, A=abundant, C=common, R=rare, T=trace
THIN SECTION LABEL ID  369-U1512A-52R-1-W 43/46-TSB-TS17
Observer: AM
Thin section no.: 17
Unit/subunit: Unit II-b
Thin section summary: A silty claystone with moderately developed lamination. The rock sample is moderately sorted and shows alternation of clay-sized and silt-sized layers. Mineral grains are generally subrounded and are commonly quartz within a clay-rich matrix. Other minerals/bioclasts are muscovite, siderite (silt-sized grains), mica (biotite) and sponge spicula. Tubular burrows maybe present in the thin section.

Sediments and Sedimentary Rock

Complete Lithology Name: silty claystone

<table>
<thead>
<tr>
<th>GRAIN SIZE</th>
<th>Gravel</th>
<th>Sand</th>
<th>Silt</th>
<th>Clay</th>
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</thead>
<tbody>
<tr>
<td>Percent</td>
<td>0</td>
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<td>5</td>
<td>95</td>
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<thead>
<tr>
<th>COMPOSITION</th>
<th>Siliciclastic</th>
<th>Calcareous</th>
<th>Biosiliceous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral grains (%)</td>
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</tr>
<tr>
<td>Cement (%)</td>
<td>95</td>
<td>5</td>
<td>0</td>
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<table>
<thead>
<tr>
<th>MINERAL GRAIN ROUNDEDNESS</th>
<th>MINERAL GRAIN SORTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>sub-rounded</td>
<td>moderate</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Mineral grain</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz</td>
<td>C</td>
</tr>
<tr>
<td>Muscovite mica</td>
<td>T</td>
</tr>
<tr>
<td>Biotite mica</td>
<td>T</td>
</tr>
<tr>
<td>Clay</td>
<td>D</td>
</tr>
<tr>
<td>Siderite</td>
<td>T</td>
</tr>
<tr>
<td>Other mineral grains</td>
<td>C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Biogenic material</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sponge spicules</td>
<td>T</td>
</tr>
</tbody>
</table>

D=dominant, A=abundant, C=common, R=rare, T=trace
THIN SECTION LABEL ID: 369-U1512A-53R-7-W 42/45-TSB-TS18
Thin section no.: 18
Observer: MGT
Unit/subunit: Unit II-b
Thin section summary: This section shows two silty claystone beds, lighter and darker brown-gray colored ones, with sharp boundary between them. Sand-sized mineral grains are feldspars that are altered to clay. Quartz are mostly silt-sized. The darker brown shade of one of the beds comes from streaks of higher Fe-oxide contents.

Plane-polarized: 44000721  Cross-polarized: 44000741

Sediments and Sedimentary Rock

Complete Lithology Name: silty claystone with silt
Remarks: Section showing banded claystone of lighter and darker brown shade with sharp boundary. Sand-sized mineral grains are feldspars altered to clay. Quartz mostly silt-sized. Darker brown shading comes from streaks of higher Fe-oxide contents.

<table>
<thead>
<tr>
<th>GRAIN SIZE</th>
<th>Gravel</th>
<th>Sand</th>
<th>Silt</th>
<th>Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>0</td>
<td>5</td>
<td>3</td>
<td>92</td>
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<thead>
<tr>
<th>COMPOSITION</th>
<th>Siliciclastic</th>
<th>Calcareous</th>
<th>Biosiliceous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral grains (%)</td>
<td>90</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Cement (%)</td>
<td>50</td>
<td>40</td>
<td>0</td>
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<table>
<thead>
<tr>
<th>MINERAL GRAIN ROUNDEDNESS</th>
<th>MINERAL GRAIN SORTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>sub-rounded</td>
<td>moderate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mineral grain</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz</td>
<td>R</td>
</tr>
<tr>
<td>Plagioclase feldspar</td>
<td>C</td>
</tr>
<tr>
<td>Clay</td>
<td>A</td>
</tr>
<tr>
<td>Glaucnite</td>
<td>T</td>
</tr>
<tr>
<td>Other mineral grains</td>
<td>R</td>
</tr>
</tbody>
</table>

D=dominant, A=abundant, C=common, R=rare, T=trace
THIN SECTION LABEL ID: 369-U1512A-54R-5-W 89/92-TSB-TS19
Observer: MGT
Thin section summary:
A silty claystone with outlines of two burrows shown in macroscopic description as
darker shade mottling. The burrows with darker shade are due to presence of pyrite.
Pyrite forms rounded grains inside the burrows, Quartz domites the silt-sized grains with
minor feldspar, micas (biotite and muscovite, chlorite). Siliceous and calcareous
bioclasts are also present in trace amount.

Plane-polarized: 44000681
Cross-polarized: 44000701

Sediments and Sedimentary Rock

Complete Lithology Name: silty claystone
Remarks: Section showing burrows with darker shade due to pyrite content.

<table>
<thead>
<tr>
<th>GRAIN SIZE</th>
<th>Gravel</th>
<th>Sand</th>
<th>Silt</th>
<th>Clay</th>
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</thead>
<tbody>
<tr>
<td>Percent</td>
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<td>13</td>
<td>87</td>
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<thead>
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<th>COMPOSITION</th>
<th>Siliciclastic</th>
<th>Calcareous</th>
<th>Biosilicoseous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral grains (%)</td>
<td>90</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Cement (%)</td>
<td>50</td>
<td>40</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MINERAL GRAIN ROUNNEDNESS</th>
<th>MINERAL GRAIN SORTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>subangular</td>
<td>moderate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mineral grain</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz</td>
<td>C</td>
</tr>
<tr>
<td>Plagioclase feldspar</td>
<td>T</td>
</tr>
<tr>
<td>Muscovite mica</td>
<td>T</td>
</tr>
<tr>
<td>Biotite mica</td>
<td>T</td>
</tr>
<tr>
<td>Chlorite</td>
<td>T</td>
</tr>
<tr>
<td>Clay</td>
<td>A</td>
</tr>
<tr>
<td>Pyrite</td>
<td>T</td>
</tr>
<tr>
<td>Other mineral grains</td>
<td>R</td>
</tr>
</tbody>
</table>

D=dominant, A=abundant, C=common, R=rare, T=trace
THIN SECTION LABEL ID: 369-U1512A-56R-1-W 115/118-TSB-TS20
Thin section no.: 20
Observer: MGT
Unit/subunit: Unit II-b
Thin section summary: This thin section shows a silty claystone with moderately developed lamination and almost equal amounts of clay and calcareous cement.

Plane-polarized: 44000641
Cross-polarized: 44000661

Sediments and Sedimentary Rock

Complete Lithology Name: silty claystone
Remarks: Moderately developed lamination in silty claystone with almost equal amounts of clay and calcareous cement.

<table>
<thead>
<tr>
<th>GRAIN SIZE</th>
<th>Gravel</th>
<th>Sand</th>
<th>Silt</th>
<th>Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>98</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COMPOSITION</th>
<th>Siliciclastic</th>
<th>Calcareous</th>
<th>Biosiliceous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral grains (%)</td>
<td>90</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Cement (%)</td>
<td>50</td>
<td>40</td>
<td>0</td>
</tr>
</tbody>
</table>

MINERAL GRAIN ROUNDEDNESS: subangular
MINERAL GRAIN SORTING: moderate

<table>
<thead>
<tr>
<th>Mineral grain</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz</td>
<td>R</td>
</tr>
<tr>
<td>Plagioclase feldspar</td>
<td>T</td>
</tr>
<tr>
<td>Muscovite mica</td>
<td>T</td>
</tr>
<tr>
<td>Clay</td>
<td>A</td>
</tr>
<tr>
<td>Other mineral grains</td>
<td>C</td>
</tr>
</tbody>
</table>

D=dominant, A=abundant, C=common, R=rare, T=trace
THIN SECTION LABEL ID: 369-U1512A-62R-7-W 70/73-TSB-TS21  Thin section no.: 21
Observer: MGT  Unit/subunit: Unit II-b
Thin section summary: A sandy siltstone composed dominantly of siderite grains set in a matrix of clay and calcite cement of equal proportions.

Plane-polarized: 44000601  Cross-polarized: 44000621

Sediments and Sedimentary Rock

Complete Lithology Name: sandy siltstone with siderite

Remarks:

<table>
<thead>
<tr>
<th>GRAIN SIZE</th>
<th>Gravel</th>
<th>Sand</th>
<th>Silt</th>
<th>Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>0</td>
<td>30</td>
<td>65</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COMPOSITION</th>
<th>Siliciclastic</th>
<th>Calcareous</th>
<th>Biosiliceous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral grains (%)</td>
<td>0</td>
<td>95</td>
<td>0</td>
</tr>
</tbody>
</table>

| Cement (%) | 50 | 40 | 0 |

<table>
<thead>
<tr>
<th>MINERAL GRAIN ROUNDEDNESS</th>
<th>MINERAL GRAIN SORTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>sub-rounded</td>
<td>well</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mineral grain</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz</td>
<td>T</td>
</tr>
<tr>
<td>Clay</td>
<td>A</td>
</tr>
<tr>
<td>Siderite</td>
<td>A</td>
</tr>
<tr>
<td>Pyrite</td>
<td>T</td>
</tr>
</tbody>
</table>

D=dominant, A=abundant, C=common, R=rare, T=trace