Wallkilldellite  \( \text{Ca}_2\text{Mn}^{2+}3(\text{AsO}_4)2(\text{OH})4\cdot9\text{H}_2\text{O} \)

**Crystal Data:** Hexagonal.  
Point Group: 6/m 2/m 2/m, 6 m2, or 6mm. As flattened, radial clusters of platy crystals, to about 0.1 mm.

**Physical Properties:** Cleavage: Perfect on \{0001\}. Hardness = \(\sim 3\)  
\(D(\text{meas.}) = 2.85(5)\)  
\(D(\text{calc.}) = 2.90\)

**Optical Properties:** Semitransparent.  
Color: Dark red.  
Streak: Pale orange.  
Luster: Vitreous on cleavage surfaces; slightly resinous on fracture surfaces.  
Optical Class: Uniaxial (–).  
Pleochroism: \(O = \) reddish orange; \(E = \) pale pinkish orange.  
Absorption: Moderate; \(O > E\).  
\(\omega = 1.728(4)\)  
\(\varepsilon = \) n.d.

**Cell Data:** Space Group: \(P6_3/mmc, P6 \ 2c, \) or \(P6_3mc\).  
\(a = 6.506(7)\)  
\(c = 23.49(3)\)  
\(Z = [1]\)

**X-ray Powder Pattern:** Sterling Hill, New Jersey, USA.  
\(11.5\ (100), 5.61\ (90), 2.844\ (60), 2.748\ (50), 2.545\ (50), 4.56\ (40), 3.25\ (40)\)

**Chemistry:**

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\text{As}_2\text{O}_3)</td>
<td>27.4</td>
<td>30.52</td>
</tr>
<tr>
<td>(\text{SiO}_2)</td>
<td>1.7</td>
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</tr>
<tr>
<td>(\text{FeO})</td>
<td>0.3</td>
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<tr>
<td>(\text{MnO})</td>
<td>27.0</td>
<td>28.26</td>
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<tr>
<td>(\text{CuO})</td>
<td>3.3</td>
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<tr>
<td>(\text{ZnO})</td>
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<tr>
<td>(\text{MgO})</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td>(\text{CaO})</td>
<td>12.4</td>
<td>14.90</td>
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<tr>
<td>(\text{H}_2\text{O})</td>
<td>[27.0]</td>
<td>26.32</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.00</td>
</tr>
</tbody>
</table>

(1) Sterling Hill, New Jersey, USA; \(\text{H}_2\text{O}\) by difference.  
(2) \(\text{Ca}_2\text{Mn}^{3+}(\text{AsO}_4)2(\text{OH})4\cdot9\text{H}_2\text{O}\).

**Occurrence:** Extremely rare in massive granular franklinite-willemite ore from a metamorphosed stratiform zinc orebody (Sterling Hill).

**Association:** Manganese cuprian adamite, franklinite, willemite, calcite (Sterling Hill); coralloite, manganohörnesite, rhodochrosite, sarkinite, sterlignhillite, strashimirite, castellaroite (Monte Nero).

**Distribution:** From Sterling Hill, Ogdensburg, Sussex Co., New Jersey, USA. At the Monte Nero mine, Rocchetta Vara, La Spezia, Liguria, Italy.

**Name:** For the dell of the Wallkill River, in which both the Sterling Hill and the Franklin deposits were discovered.

**Type Material:** Harvard University, Cambridge, Massachusetts, 113445; National Museum of Natural History, Washington, D.C., USA, 149767.

**References:**  
(2) Kampf, A.R., F. Cámara, M.E. Ciriotti, B.P. Nash, C. Belestra, and L. Chiappino (2016) Castellaroite, \(\text{Mn}^{3+}(\text{AsO}_4)2\cdot4.5\text{H}_2\text{O}\), a new mineral from Italy related to metaswitzerite. Eur. J. Mineral., 28(3), 687-696 [locality].