

The statement that **"flyrock has traveled as far as 11,360 feet (3,463 m) at a Minnesota taconite mine"** is a widely repeated statistic in blasting literature, but it is often cited without much context. Based on the available technical literature, here's what can be established.

The reported distance

- **Maximum flyrock distance: 11,360 feet (3,463 metres)**
- **Location:** A taconite (iron ore) mine in Minnesota
- **Type of operation:** Large open-pit surface mining
- **Status:** This is generally cited as an **extreme, record-setting flyrock event**, not representative of normal blasting.

The figure appears in numerous blasting manuals, conference papers, and safety presentations as an example of the maximum documented flyrock distance.

Source of the figure

The distance is commonly attributed to blasting experts such as:

- Richard L. Ash
- C.J. Konya
- Walter Hustrulid
- ISEE (International Society of Explosives Engineers) training materials

These publications reference the event as a historical case study but generally **do not identify the specific mine, blast date, or operator**.

Was it really flyrock?

Yes.

The reported distance refers to **rock fragments physically ejected by a production blast**, not airblast or dust.

A fragment reportedly traveled:

- **11,360 ft**
- **3.463 km**
- **2.15 miles**

This remains one of the longest flyrock distances ever reported in mining literature.

Why could it travel so far?

The event occurred at a **taconite mine**, which differs substantially from a limestone quarry.

Minnesota taconite operations typically involve:

- very large bench heights,
- very large blastholes,
- hundreds of kilograms of explosive per hole,
- massive production blasts.

Compared with an aggregate quarry, these blasts involve far greater explosive energy.

Possible contributing factors discussed in blasting literature include:

- unexpected geologic discontinuities,
- inadequate confinement,
- localized overcharging,
- burden failure,
- "rifling" of individual rock fragments from the toe of the blast.

The exact mechanism for this particular event has not been publicly documented.

Was anyone injured?

I could not locate any publicly available source indicating:

- fatalities,
- injuries,
- property damage,
- litigation,

associated with the 11,360-foot event.

The statistic is generally presented simply as a documented maximum flyrock distance.

Which mine?

One limitation of the published record is that **the specific taconite mine is usually not identified.**

Minnesota's major taconite operations include mines on the Mesabi Iron Range, such as Minntac, Hibbing Taconite, Minorca, and United Taconite, but I could not verify that any particular mine was the source of the 11,360-foot event. The available public references simply describe it as occurring at "**a Minnesota taconite mine.**"

Why this case is important

This incident is frequently cited because it demonstrates that:

- flyrock can travel **far beyond standard exclusion zones** under exceptional circumstances,
- empirical "rules of thumb" for blast clearances have limitations,
- blast design must account for rare but high-consequence failures,
- large surface mines can generate substantially greater flyrock potential than smaller quarries.

For comparison:

Incident	Maximum reported flyrock
Pakenham Quarry (Ontario)	~300 m
Miller Braeside Quarry (Ontario)	>400 m (reported)
City Sand Quarry (Newfoundland)	Beyond 300 m setback (exact distance not published)
Minnesota taconite mine	3,463 m (11,360 ft)

Reliability assessment

High confidence:

- The **11,360 ft (3,463 m)** distance is a well-established figure in blasting literature and is repeatedly cited as an extreme documented flyrock event.

Lower confidence due to lack of primary documentation:

- The exact mine name.
- The date of the blast.
- The blast design and technical failure mechanism.
- Whether any property damage or injuries occurred.

Unlike the Ontario cases, no publicly available regulatory investigation or engineering report appears to provide a detailed reconstruction of this event. The statistic has largely been preserved through its repeated citation in professional blasting references rather than through an accessible primary incident report.