



## ECO ERA: 450 Kw Londres, Costa Rica

May 18, 2014



River Run Hydro seeks an investment partner for \$400,000 cash and guarantee of a \$1.2 million construction loan for a 40% stake or full capitalization of \$1.5 million for a 51% stake. The hydro model for Eco Era is summarized below.

| Parameter               | units                 | Value       |
|-------------------------|-----------------------|-------------|
| Available Head          | feet                  | 750         |
| Pipeline Diameter       | inches                | 18          |
| Flow velocity           | feet per second       | 5           |
| Penstock Flow           | cubic feet per second | 9           |
| Flow Rate               | gallons per minute    | 3963        |
| Pipeline Length         | feet                  | 3000        |
| Head Loss               | feet per 100 feet     | 0.4         |
| Total Head loss         | feet                  | 12          |
| Effective head          | feet                  | 738         |
| Turbine efficiency      | percentage            | 85%         |
| Hydroelectric Potential | kilowatts             | 448         |
| Annual operation period | months                | 7           |
| Sell rate               | \$/ kilowatt hour     | \$0.11      |
| Annual Revenues         | dollars               | \$248,111   |
| Capital Cost            | dollars               | \$1,750,000 |
| Payback period          | years                 | 7.1         |
| Return on Investment    | percentage            | 14.2%       |

**Property:** Five hundred hectare finca with large unnamed tributary of Naranjo River near Londres, Quepos area, southwest Costa Rica.

**Access:** Good 2WD road access to property boundary and easily improved internal 4WD roads.

**Grid:** Single-phase passes less than 300 m from the target turbine location

**Mode:** Joint venture. The larger property is subdivided and may require more than one owner for joint venture. Land owner: 20%, Investor 40%, RRH 40%

**Profits:** 7.1-year payback, 14.2% ROI on a \$1.75 million capital investment

**Flow Measurement:** Large rainy season flows, nominal dry season, not yet gaged.

### Challenges

- 1) Complicated ownership structure; primary owner that has sold sections to parties loosely interested in alternative community.
- 2) Long pipeline for relatively small flow rate
- 3) Dry season only
- 4) Environmental sensitivity of New-Age neighborhood.

### Advantages

- 1) Very easy terrain for pipeline installation, close to grid
- 2) Good access and not particularly remote
- 3) Large amount of head.

