

Carnegie Mellon University

Carnegie Institute of Technology

THESIS

Submitted in partial fulfillment of the requirements
for the degree of **Doctor of Philosophy**

**Measurement and Recovery of Rare Earth
Elements from Hypersaline Fluids**

Clinton W. Noack

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in

Civil & Environmental Engineering

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Chapter 1

Introduction, problem identification, and research goals

1.1 Introduction

1.2 Problem identification

1.3 Research goals