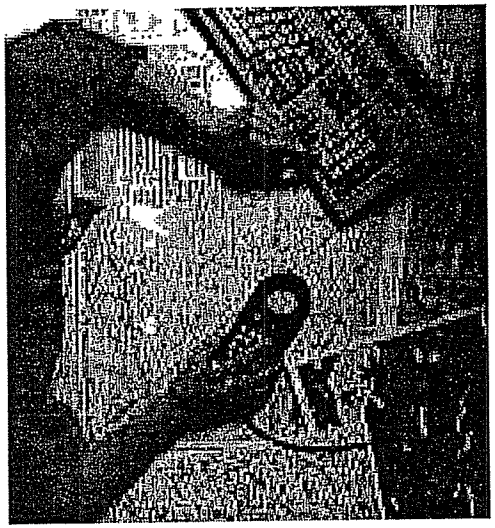
Timber and Gravel Appraisals

- Introduction
  - Olympic Resource Management, Vancouver
  - Appraisal Experience
- Timber and Gravel
  1 Resource Inventory
  2 Valuation
  3 Current Issues

- Timber Inventory
  - Review of Available Information
  - Preliminary Assessment and Planning
  - Timber Cruise
    - Cruising Standards
      - Inventory > 250 ha
      - Cutblock 1 - 250 ha
      - Single tree
    - Level of Risk
    - Forest Cover Stratification



- Cruise Plan
  - Number of sample plots / location
  - Logistics (access) and approvals
- Field Work
  - Data collection
- Mapping and Data Compilation
  - Merch. volume by species and grade

– Operable Timber Volumes
  - Net Downs for Environmental Protection
    - Crown Lands - Forest Practices Code
    - Private Lands - Private Land Forest Practices Regulations
    - Real Estate - Tree buffers and retention patches.

- Net Downs for Inaccessible and Uneconomic Areas
  - Physical access
  - Volume & quality timber vs. costs of extraction
- Development Plan
  - Road locations / cutblocks / harvesting systems
  - Harvesting sequence

- Timber Valuation
  - Stumpage Appraisal Methodology
    1 Rothery System - smaller parcels,
    2 DCF & Comparable Sales - large timberland areas.
  - Rothery Formula:

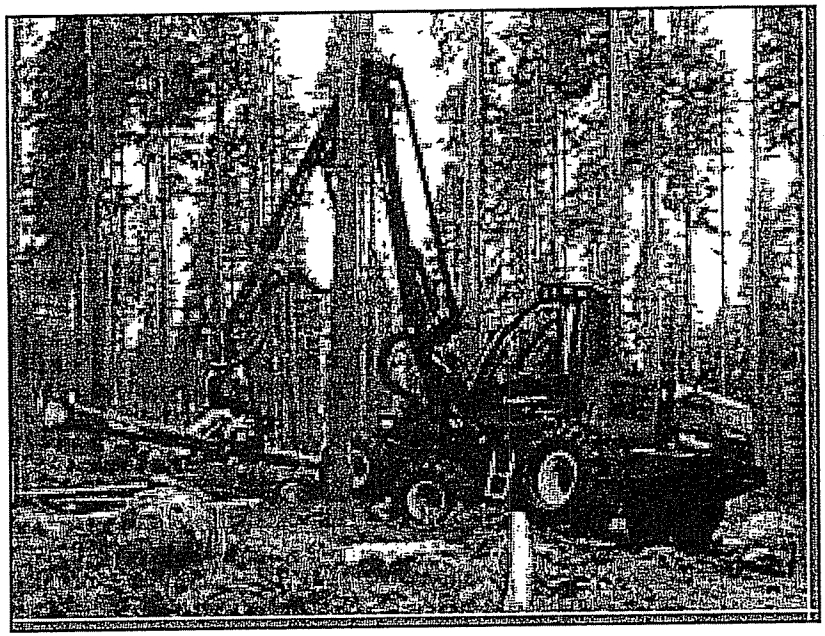
	Average Market Value of the Logs
Less	Logging & Transportation Costs
Equals	Conversion Return (Value to Owner)
Less	Profit & Risk Allowance
Equals	Stumpage Value

Usually valued on per cubic meter basis ($/m^3).

  - Log Prices
    - Domestic — Coast: Vancouver Log Market
      Interior: Local sawmills

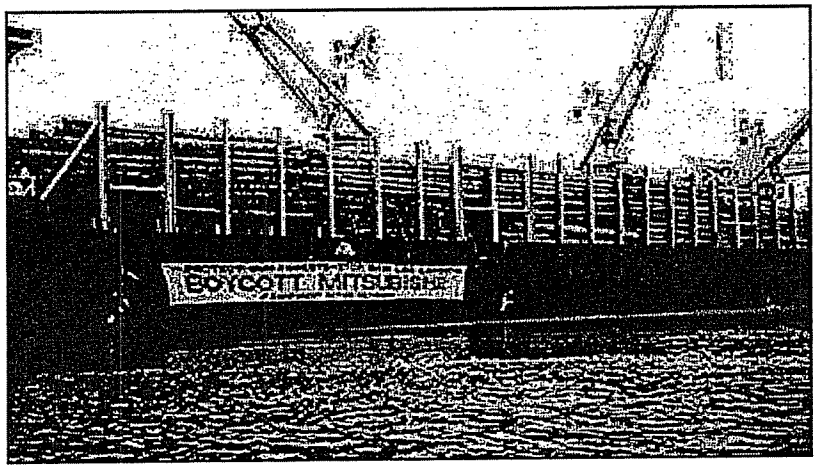
- Export — Coast: Japan and the US-PNW.
  Interior: NE Wash. & N. Idaho.
- Log Export Regulations - private lands
  - Provincial logs - lands granted after 12/03/1906.
  - Federal logs - lands granted on or prior to 12/03/1906.

– Logging Costs
- Direct costs by phase:
  - roads
  - tree-to-truck
  - transportation
  - silviculture
  - admin. & O/H



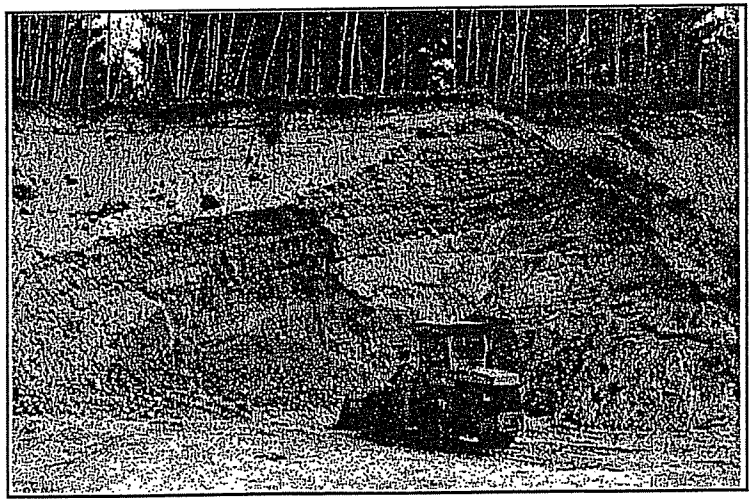
- Profit & Risk Allowance: Splitting the Conversion Return
  - Conglomerate of Items
    - income taxes, property and severance taxes;
    - carrying costs and return on invested capital;
    - allowances for noninsurable risk and entrepreneurial profit.
  - Subjectively determined because of market forces.
    - Overturn method: P&R as a % of the Logging Costs
    - Profit ratio: P&R/(Logging costs + Stumpage)
- Total Timber Value Value
  - Unit value - $/m^3 by timber type, map areas by value.
  - Reasonableness checks - comparable sales

- Timber Appraisal - Current Issues
  - Log Exports and Export Regulations

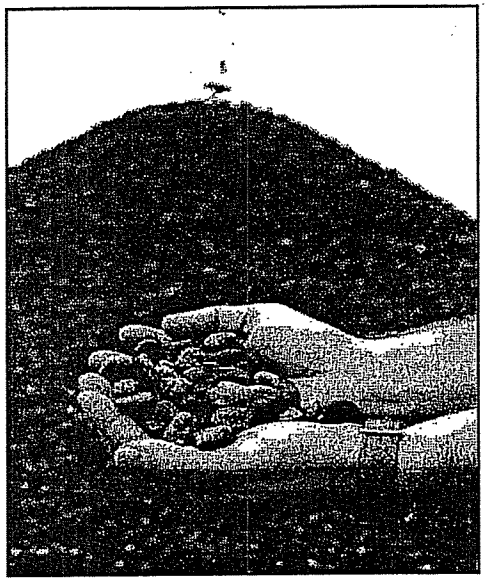


  - Timber as a Land Component or Stand Alone Interest
    - Timber Value Plus Land Value = Total Value
    - (Timber + Land) x Discount Factor = Total Value
    - Timber = Total Value
    - Immature Timber / Nonmerchantable or Marginal Timber

- Gravel
  - High Vol / Low Margin Industry, Highly Competitive
  - Transport Costs Limit Sales to Local Pits (50 - 80 km)
    - Exception - barge transportation
  - Long-term Price Trend is Flat (real $)
  - Local Shortages
    - Supply - land use regulations / reclamation costs
    - Demand - fluctuates with major construction projects



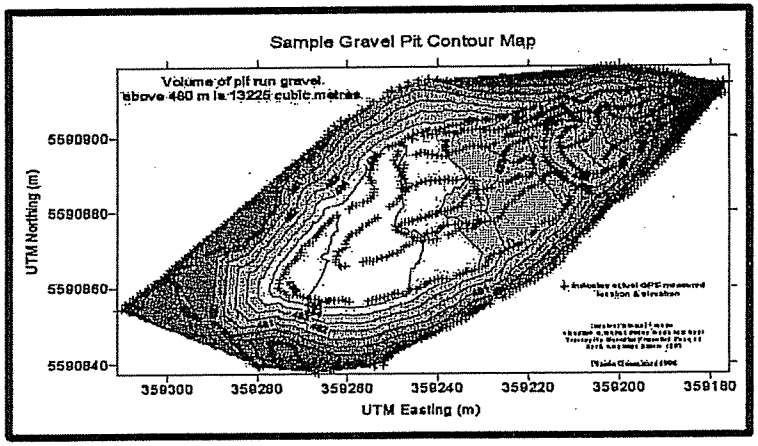
- Gravel Inventory
  - Material
    - Glacial outwash - fluvial action
    - Sorting of sediments
      - Boulders & cobbles: > 75 mm (3 in)
      - Gravel:4.75 mm - 75 mm
      - Sand:0.075 mm - 4.75 mm
      - Fines:<0.075 mm



- Ideal ratio 50:50 sand and gravel with less than 5% fines
- Production aggregate: sand and gravel with >30% gravel
- Fill aggregate: sand and gravel with < 30% gravel
- Viability of a pit is often restricted by the high sand content.
- Lower mainland aggregate market / contractor price list

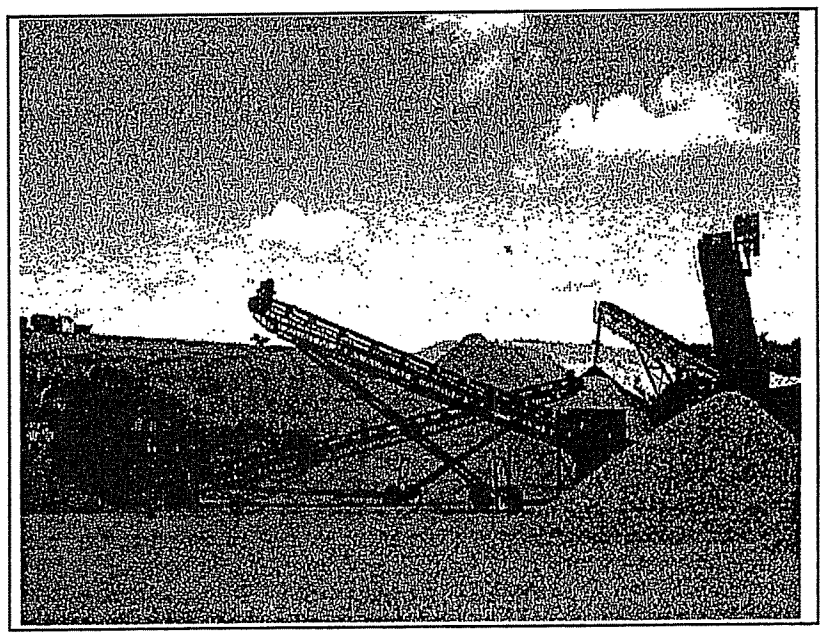
Product	Market	Price $/tn
Sand	20%	5 - 7
Shot Rock / Rip Rap	15%	6 - 13
Bulk Fill	15%	7 - 8
Road Gravels	30%	7 - 10
Premium Aggregate	20%	14 - 38

- Consulting Engineer
  - Location, Size and Quality of the Reserves
    - Prism Volume - areas by depth (stratified)
      - » Drill holes / test pits / seismic refractory surveys
    - Waste and Overburden
    - Sieve Tests - gravel/sand/fines
    - Compaction & Conversion Factors
      - » Mined by volume - marketed by weight
    - Quality - durability and piece shape
  - Extraction Plan
    - Accessibility
    - Economics
    - Regulations



- Gravel Valuation
  - Methodology
    1 Property Owner - NPV of Cash Flow from Royalties.
    2 Pit Operator - NPV of the Operations.
  - Royalty Rates
    - Range: $0.35 - $2.50/tonne
    - Land Rental
  - Operating Profits, e.g.

Composite Price $/tn	12.50
Volume Discount - 10%	1.25
Net Price	11.25
Production Costs:	
Pit Operation	5.20
Transportation (barge)	2.55
Administration & O/H	0.50
Total Production Costs	8.25
Operating Profit	3.00



- Projections
  - Production growth
  - Increasing rates / land rental / prices / costs
  - Time horizon
    - pit depletion or terminal value
  - Income Taxes
    - capital cost allowances
    - non-manufacturing / manufacturing tax rates
  - Discount Rate
    - theory: WACC
    - practise: riskless rate + risk premium
- Gravel Issues
  - Land Use Planning / Component Values