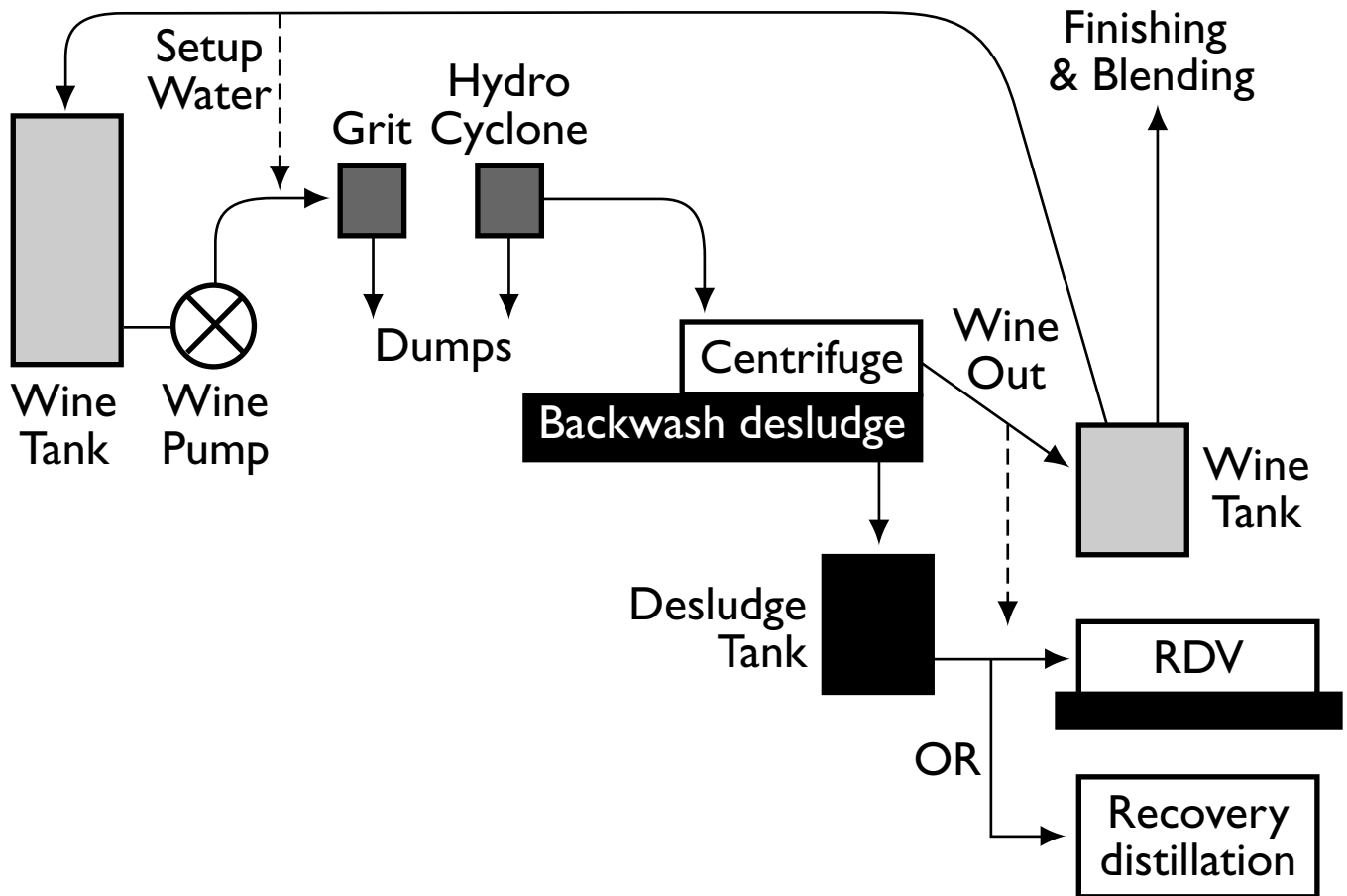


Clarification - Centrifuge



Process Events:

- Centrifuge separates fine solids from unclarified wine/juice
- Clarified wine/juice is produced
- Backwash of separated solids goes to desludge
- Desludge is reclaimed via RDV or distillation

Water Events:

- Water cleaning of lines, tanks and centrifuge
- Water used for product transfer and recirculation
- Water used for cooling of operating centrifuge
- Chemical cleaning of lines, tanks and centrifuge
- Cellar area cleaning

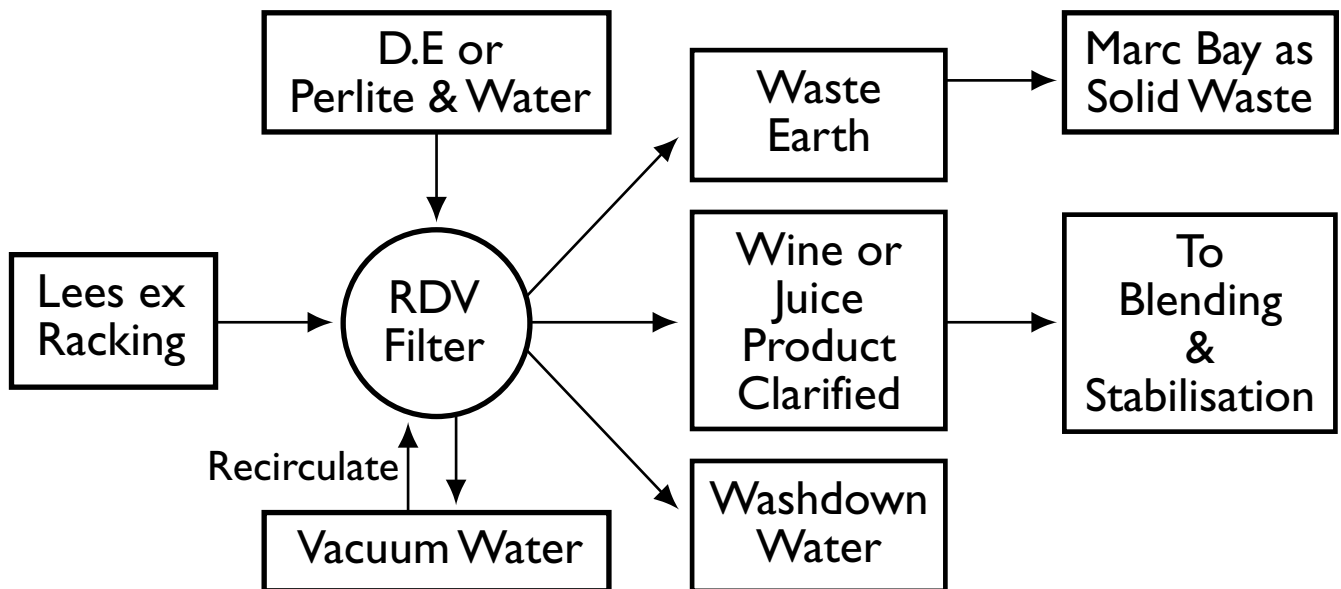
Waste Events:

- Water cleaning of lines, tanks and centrifuge
- Chemical cleaning of lines, tanks and centrifuge
- Water used for product transfer and recirculation
- Cellar area cleaning
- Desludge production from centrifuge, grit and hydrocyclone
- Product loss through water cut outs at transfers

Best Practices:

- Caustic/chemical re-use for centrifuge cleaning
- Cooling water and recirculation water re-use
- Minimising product transfer cut out volumes to drain
- Desludge lees recovery is maximised
- Smart scheduling of production batches

RDV (rotary drum vacuum) Filter



Process Events:

- Wine and juice lees are clarified
- Solid waste as spent earth is produced

Waste Events:

- Spent earth to solids waste
- Cleaning chemicals to drain
- Wash down water to drain
- Product loss through water cut out at transfers

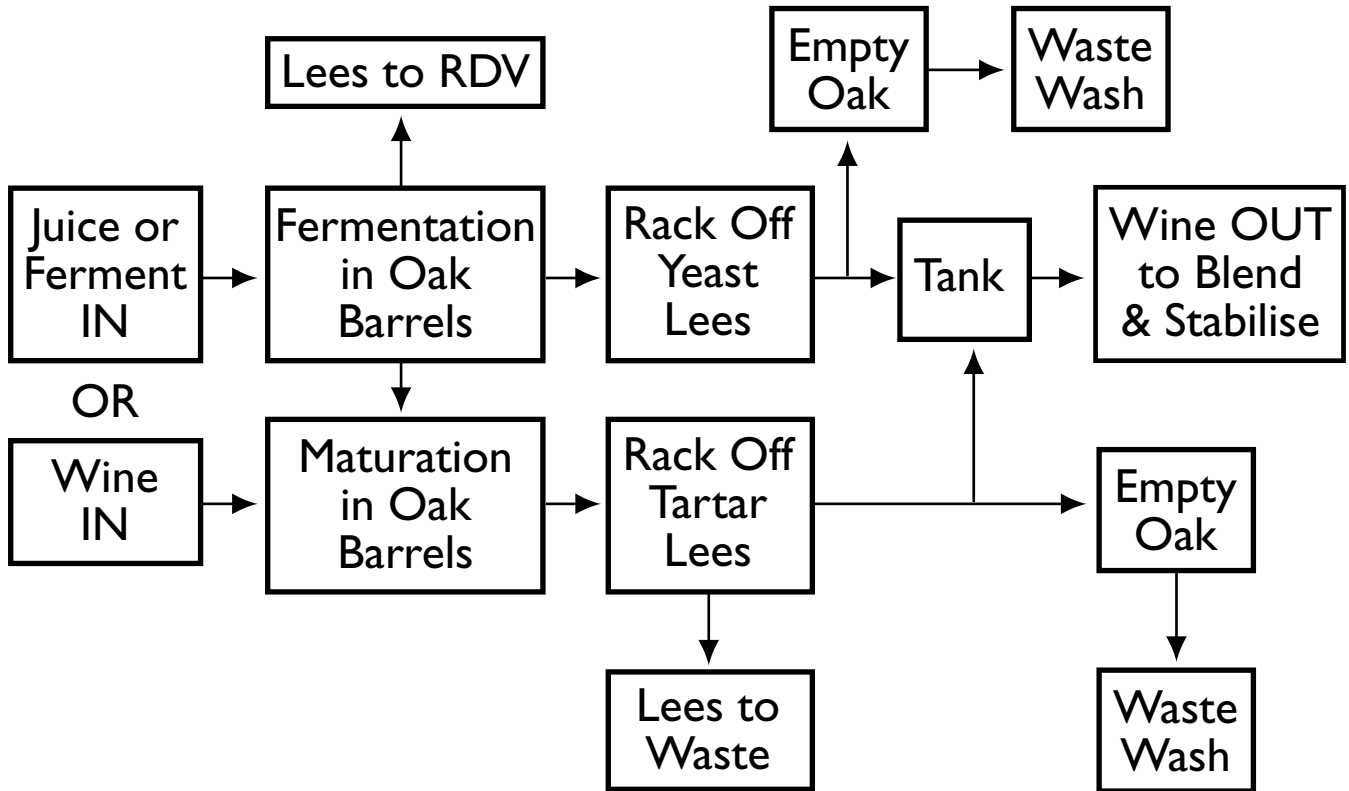
Water Events:

- Water use for product transfers
- Water use for filter cleaning
- Area cleans
- Chemical use for filter, tank and line cleaning
- Vacuum pump water for filter operation

Best Practice:

- Recirculation of filter vacuum water
- Minimising water use on earth removal from the filter
- Smart scheduling of RDV batches to maximise earth cake use

Barrel Hall/Oak



Process Events:

- Wine is transferred into barrel
- Wine is aged or fermented in barrel
- Wine is removed for blending
- Barrels are topped with wine
- Barrels are stored

Waste Events:

- Barrel wash down water to drain
- Product loss through water cut out at transfers
- Lees and solids produced as waste if not recovered/re-used

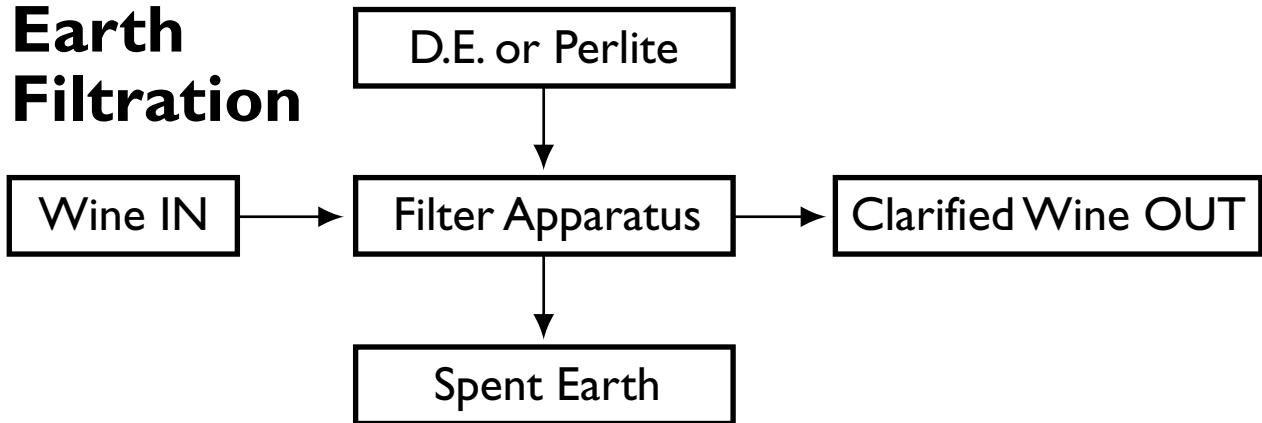
Water Events:

- Product loss through water cut out at transfers
- Barrel washing after maturation/fermentation
- Barrel storage solution preparation
- Area cleans

Best Practice:

- Lees recovery from barrel washing
- Automated barrel washing to minimise water use
- Using inert gas or pigging on wine transfers

Earth Filtration



Process Events:

- Fine solids separated
- Production of clarified wine

Water Events:

- Filter prime with citric water
- Lines cleaned
- Product transfer
- Filter cleaning post batch

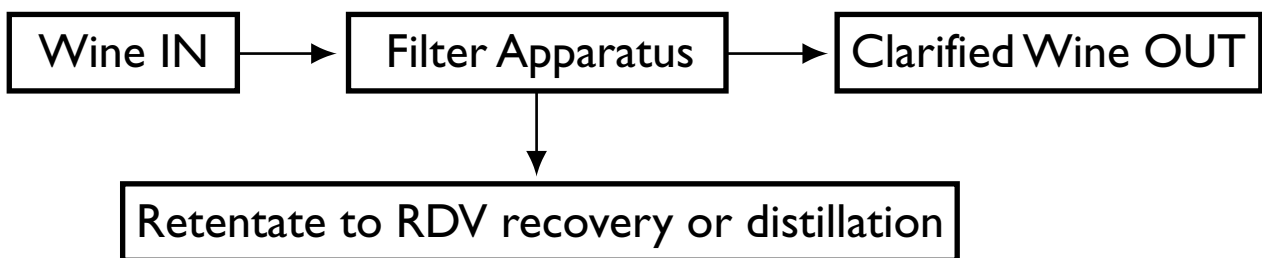
Waste Events:

- Spent Earth to marc bay
- Wash water to drain
- Product transfer cut-out to drain

Best Practice:

- Turbidity reading (NTU) based earth particle size selection for filter efficiency
- Spent earth sent to distillation recovery

Cross Flow Filtration



Process Events:

- Wine clarification
- Retentate discharge

Water Events:

- High pH clean
- Citric rinse
- Water wash

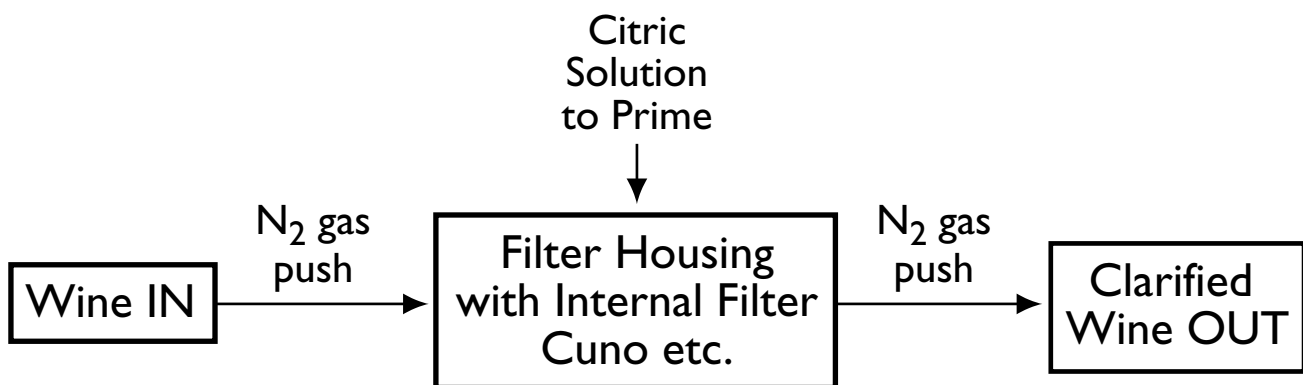
Waste Events:

- Retentate discharge
- Water wash/rinse cycles
- High pH cleans
- Citric solution rinses

Best Practice:

- N₂ gas for all wine transfers
- Retentate recovered via RDV or distillation

Cartridge Style Filter



Process Events:

- Wine is clarified through filter membranes

Waste Events:

- Citric solution discarded to drain
- Filter washdown
- Discarded filter at end of filtration process

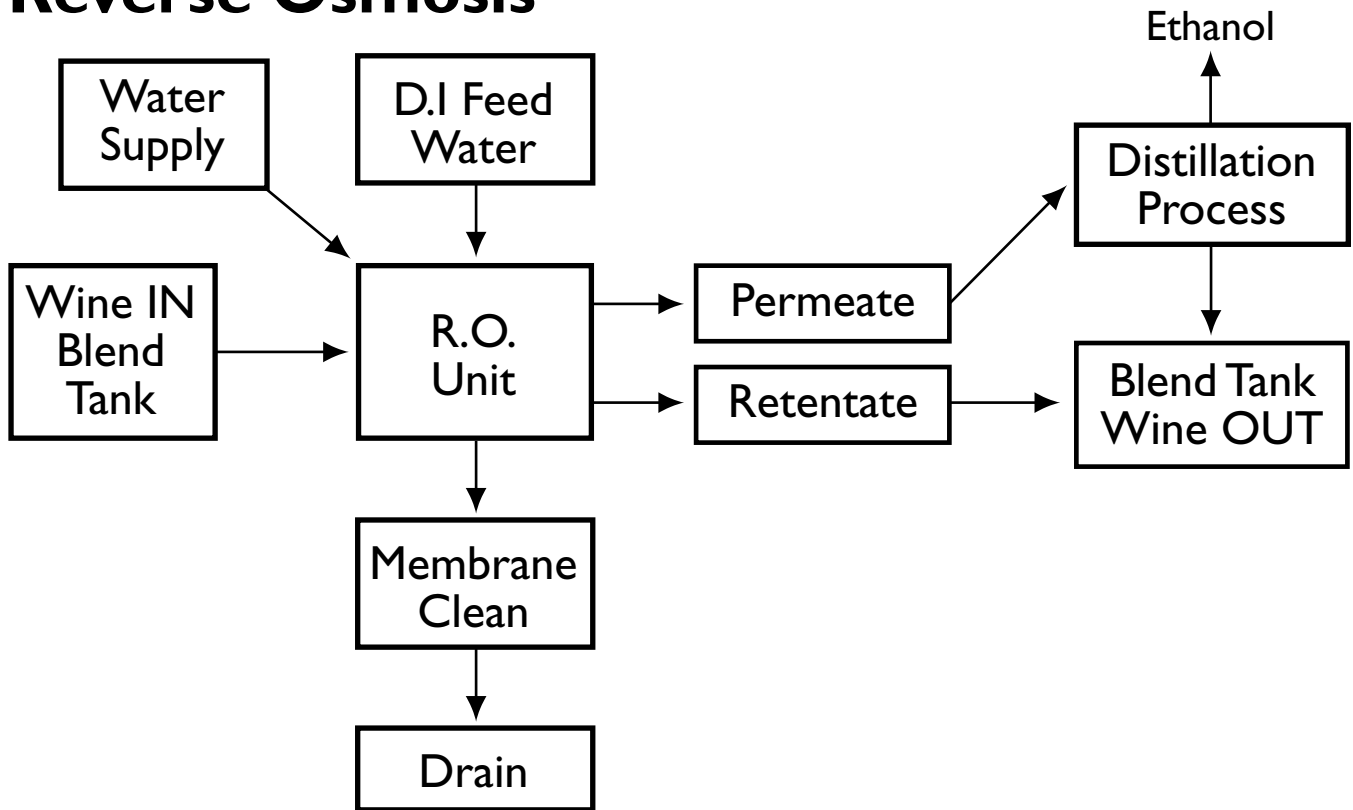
Water Events:

- Citric priming of cartridge pre filtration
- Product loss through water cut out at transfers

Best Practice:

- Using inert gas on wine transfers
- Batch scheduling to maximise filter use

Reverse Osmosis



Process Events:

- Blended wine filtered for Ethanol reduction

Waste Events:

- Citric acid solution to drain
- Rinse waters to drain
- High pH cleaner to drain
- Product loss through water cut out at transfers

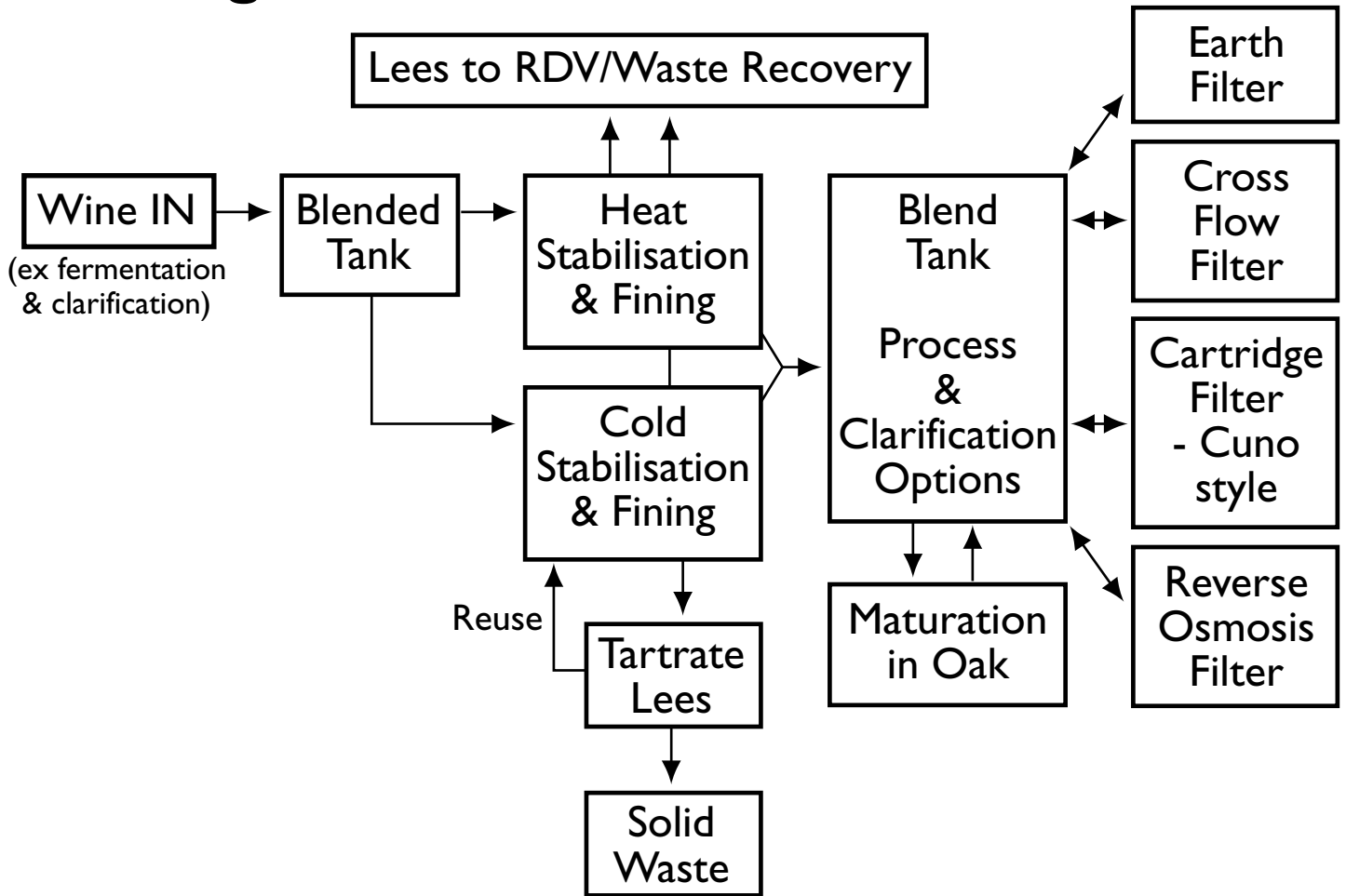
Water Events:

- DI water production for blend filtration
- Citric acid washing to clean membranes
- High pH cleaning to decolourise membranes
- Water washing to flush membranes
- Product transfer to/from RO filter unit

Best Practice:

- Minimising product transfer cut out volumes to drain
- Smart scheduling to maximise unit efficiency

Blending & Stabilisation



Process Events:

- Wines are heat and cold stabilised
- Wines are fined and blended
- Process includes clarification of wines after stabilising and blending
- Process may include oak maturation of some blends
- Lees produced from fining and stabilisation processes
- Process frequently involves use of multiple filtration options

Waste Events:

- Cleaning chemicals to drain
- Wash down water to drain
- Product loss through water cut out at transfers
- Lees and solids produced as waste if not recovered/re-used

Water Events:

- Water loss through cut out at transfers
- Area cleans
- Water use for filter, tank and line cleaning
- Chemical use for filter, tank and line cleaning

Best Practice:

- Tartrate lees recovery and re-use
- Spill containment plan
- Minimising product transfer cut out volumes to drain
- Other lees recovery is maximised
- Using inert gas or pigging on wine transfers