

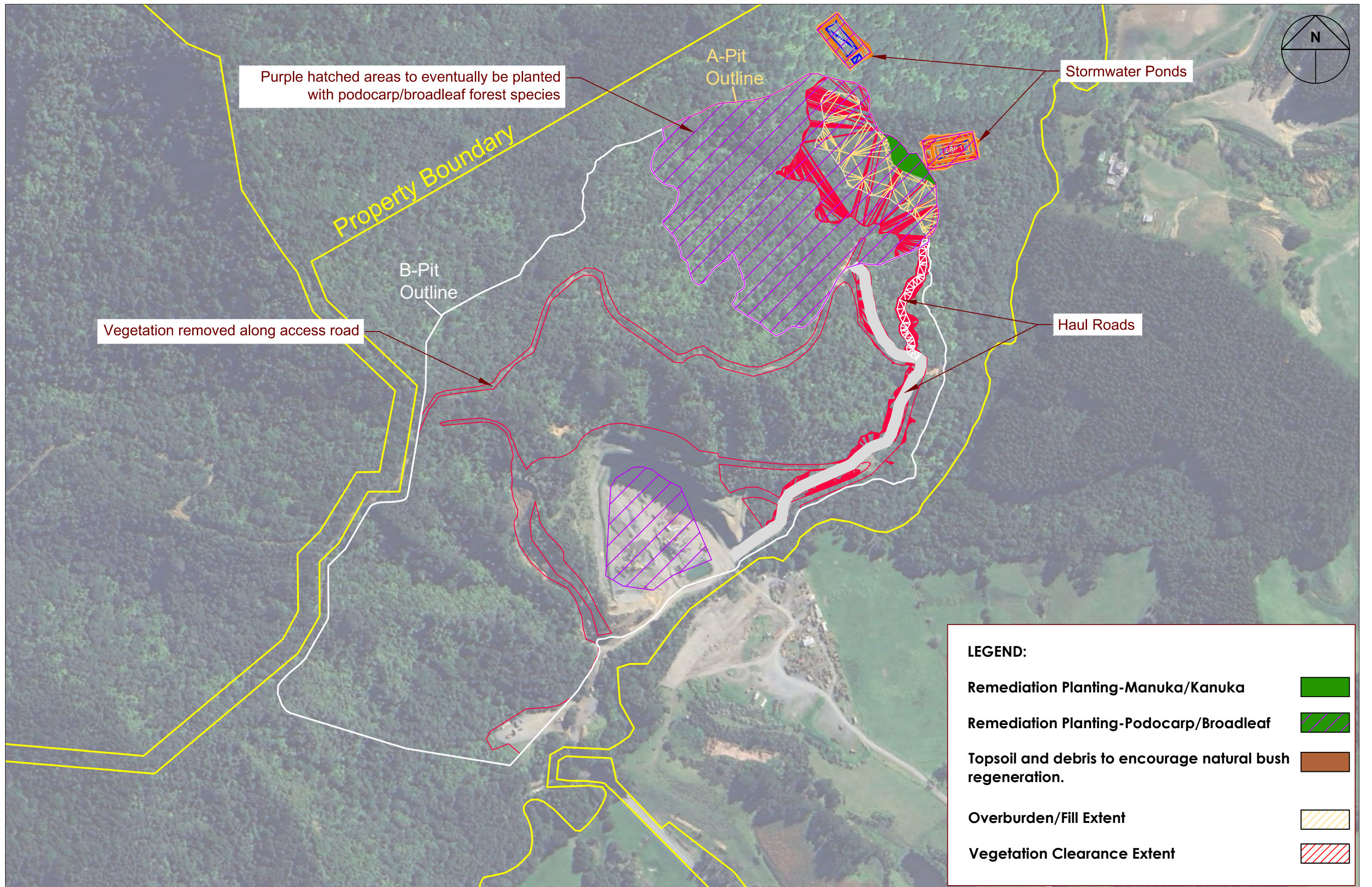


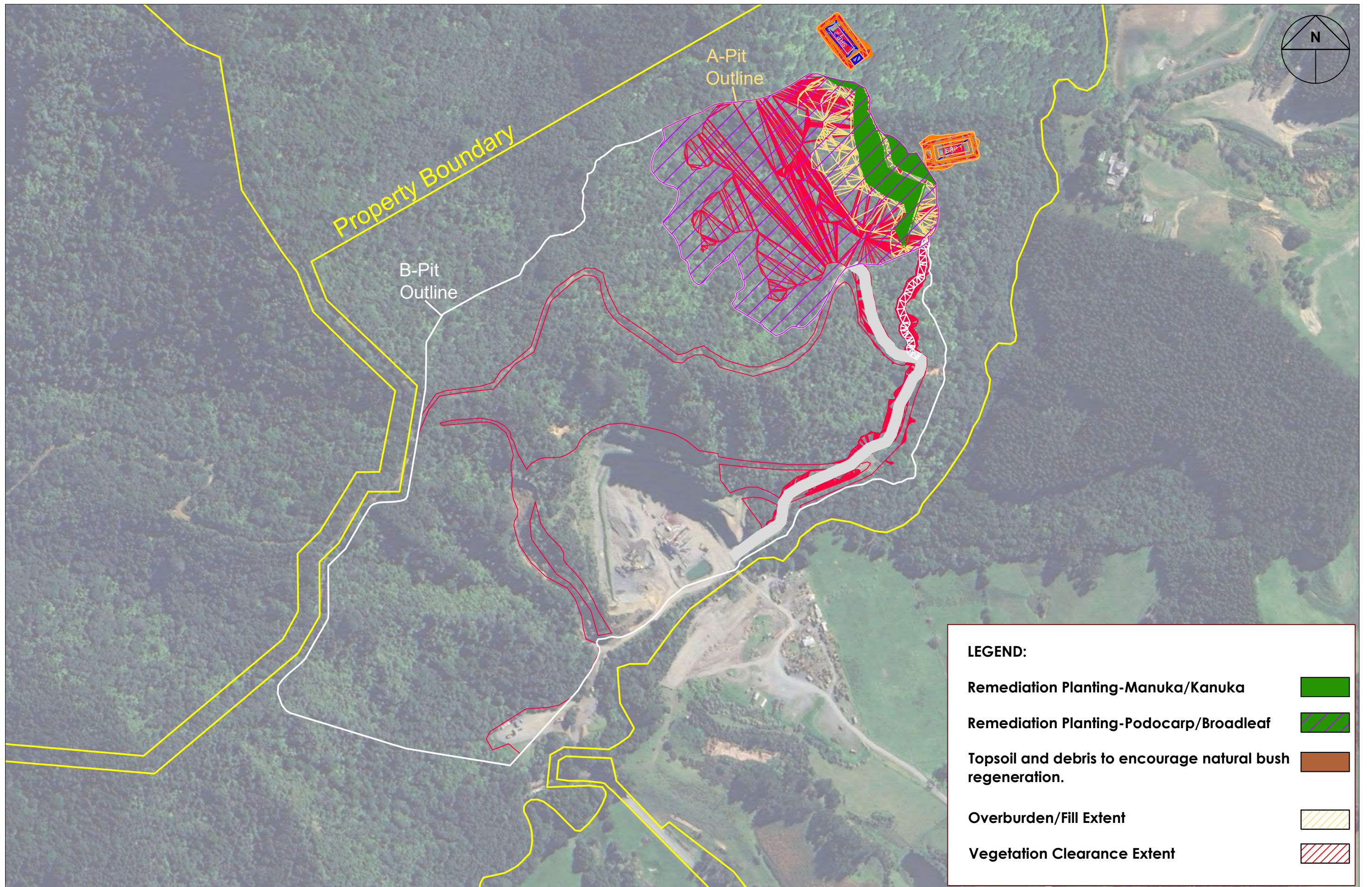
Drawing LA-001 Revision C

Year 0

Kings Quarry, Wainui - Stage 2
Landscape Remediation Planting Plans

B&A
Urban & Environmental



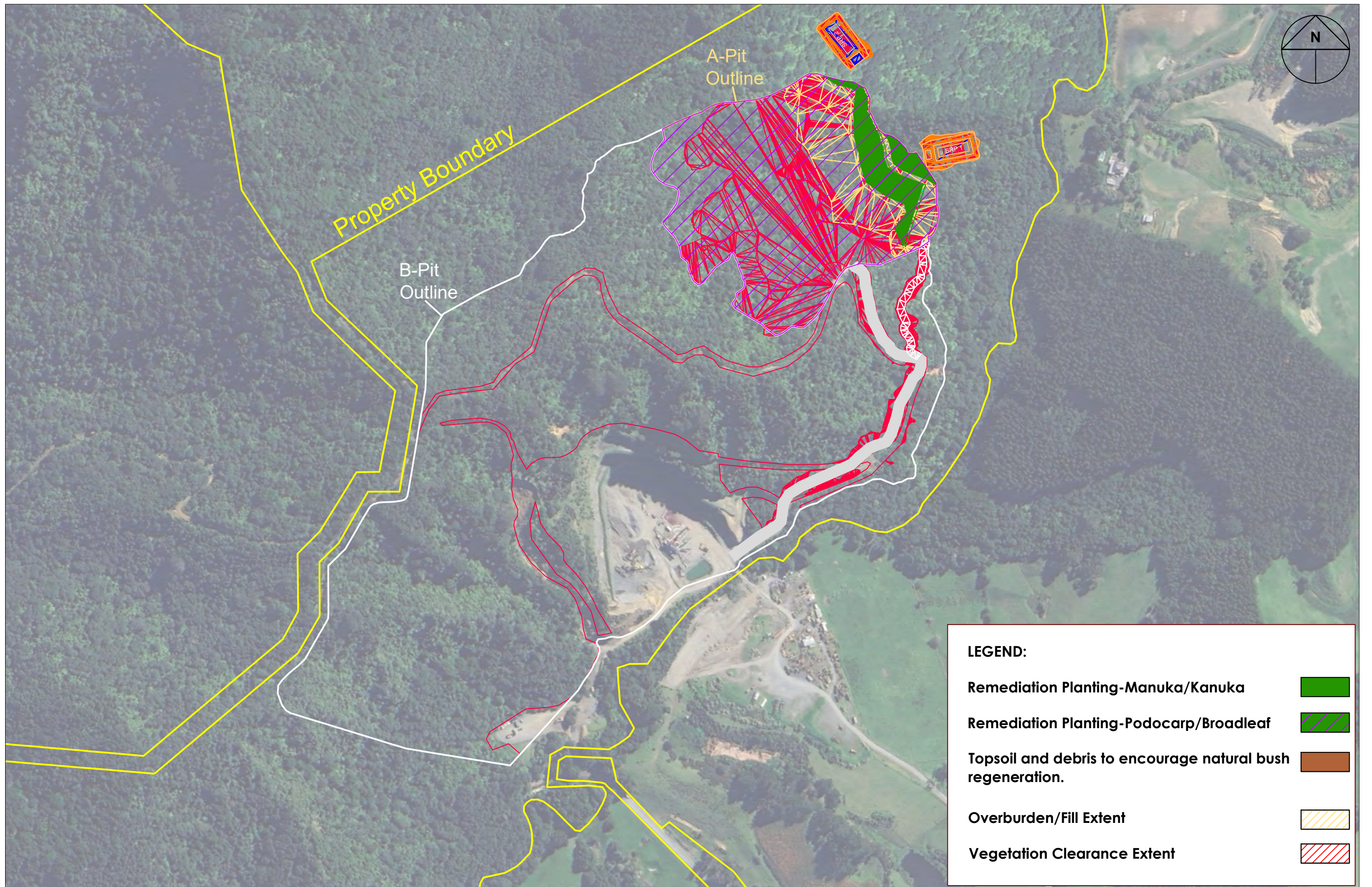


Drawing LA-003 Revision C

Year 2

Kings Quarry, Wainui - Stage 2
Landscape Remediation Planting Plans

B&A
Urban & Environmental

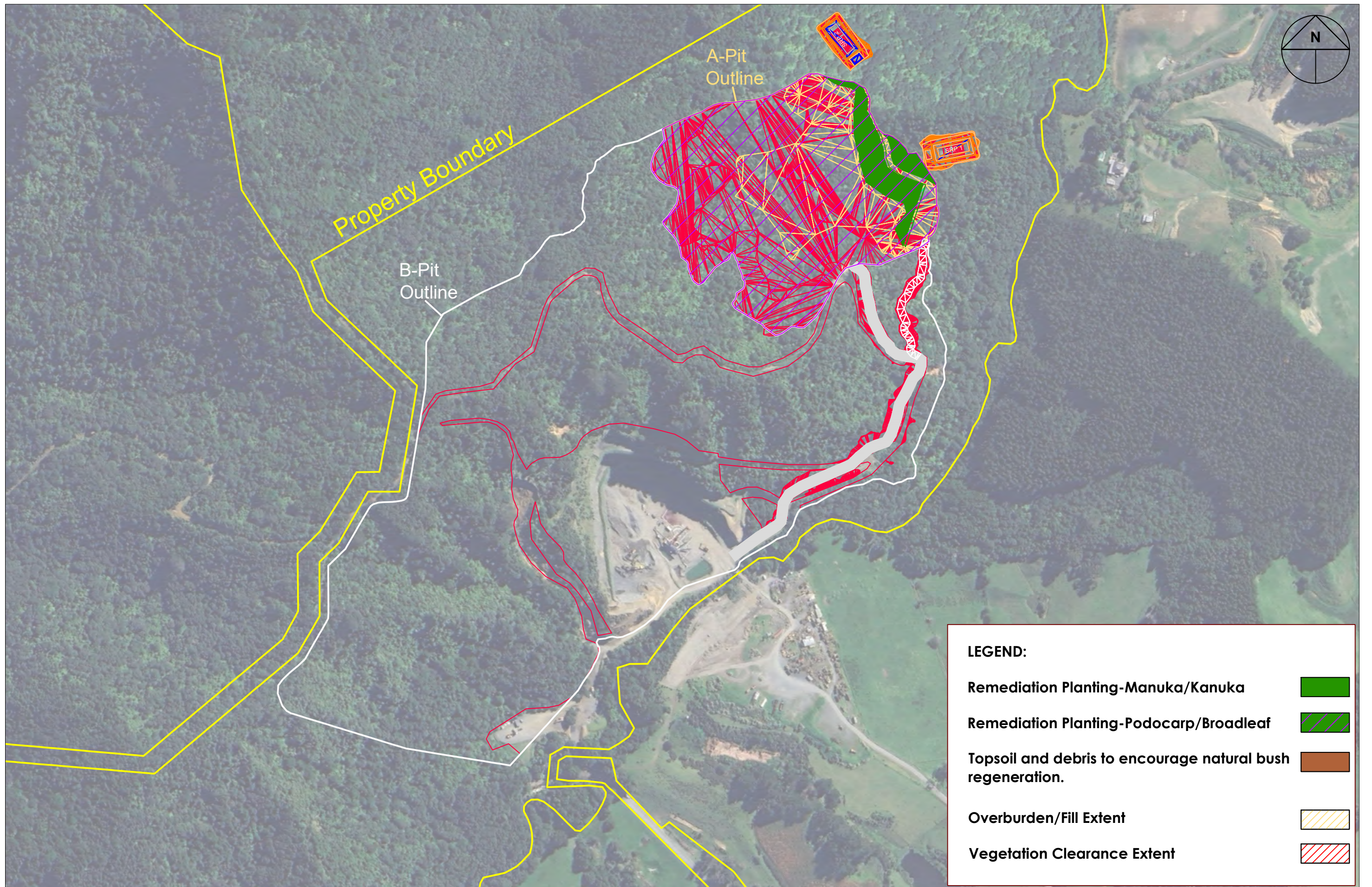


Drawing LA-004 Revision C

Year 3-4

Kings Quarry, Wainui - Stage 2
Landscape Remediation Planting Plans

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Urban & Environmental

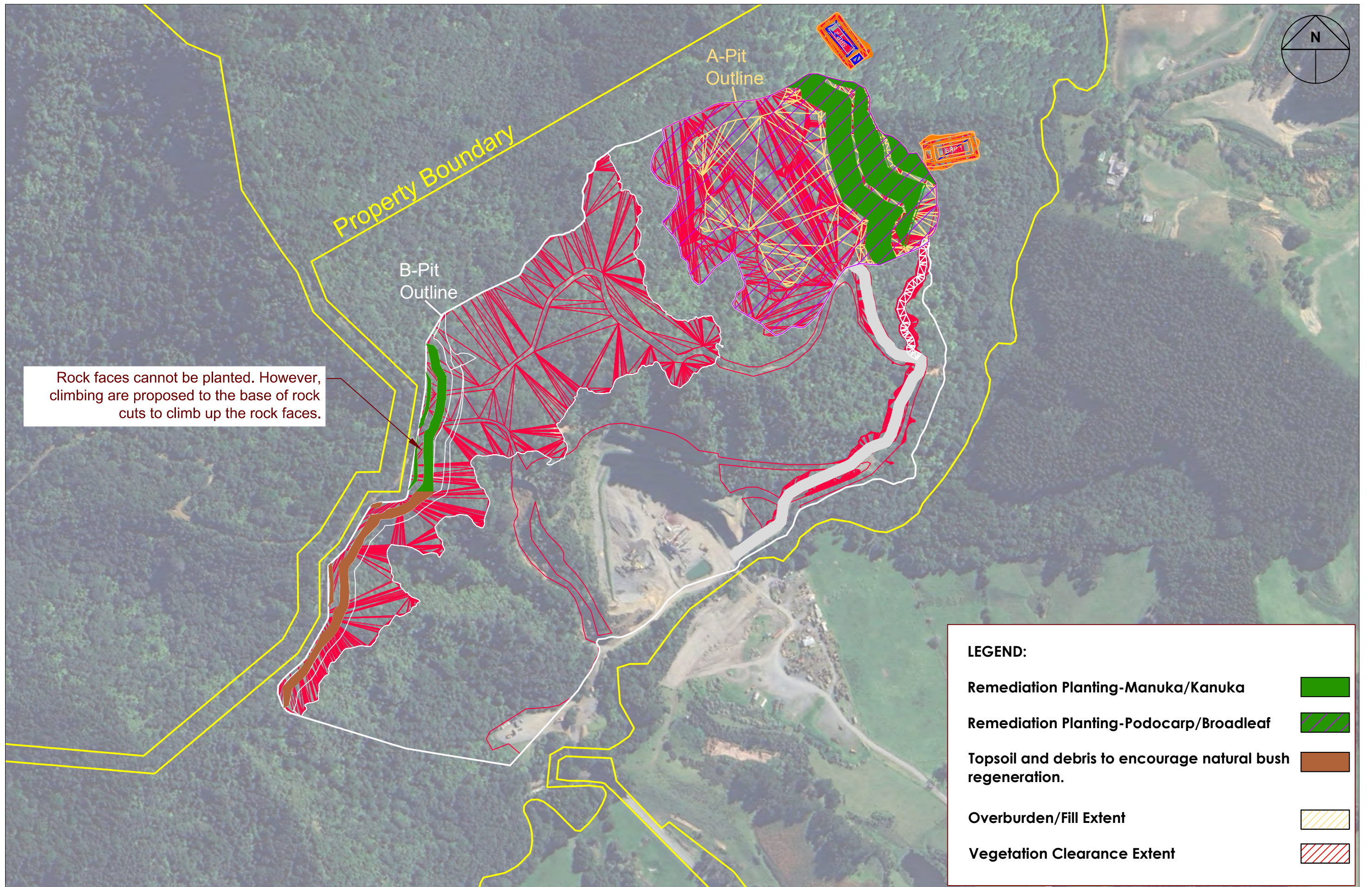


Drawing LA-005 Revision C

Year 5

Kings Quarry, Wainui - Stage 2
Landscape Remediation Planting Plans

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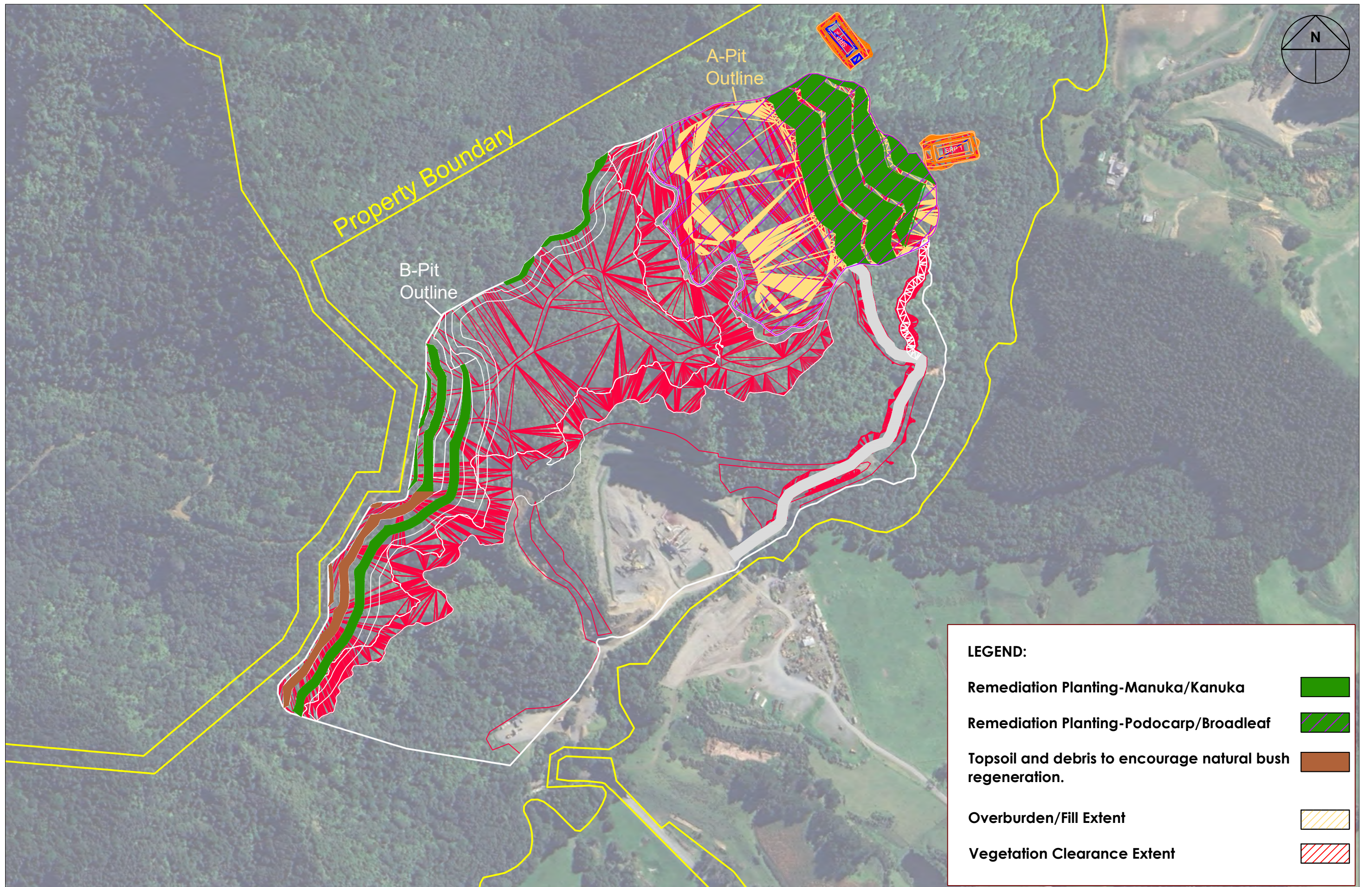


Drawing LA-006 Revision C

Year 6-10

Kings Quarry, Wainui - Stage 2
Landscape Remediation Planting Plans

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Urban & Environmental

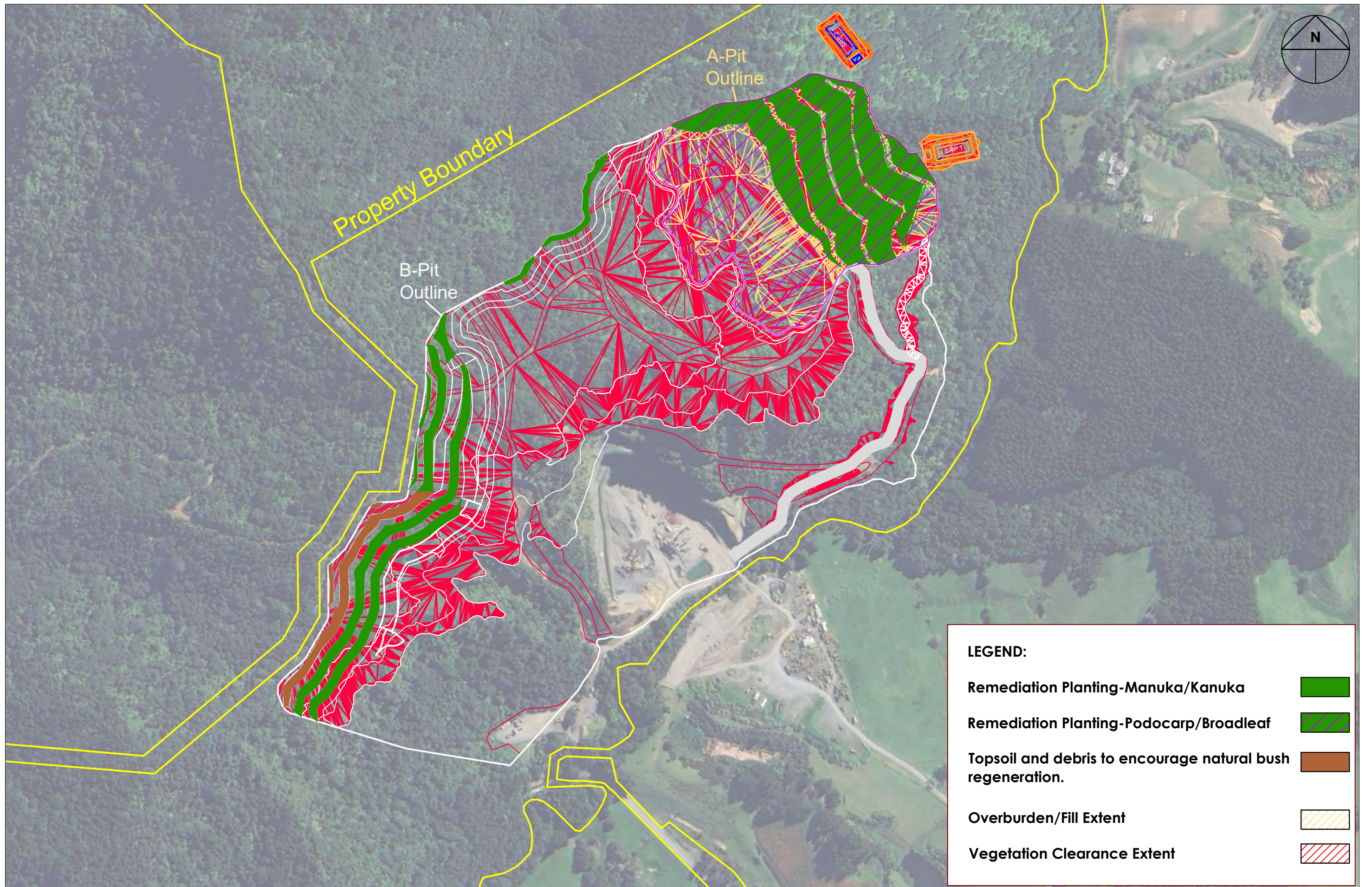


Drawing LA-007 Revision C

Year 11-15

Kings Quarry, Wainui - Stage 2
Landscape Remediation Planting Plans

B&A
Urban & Environmental

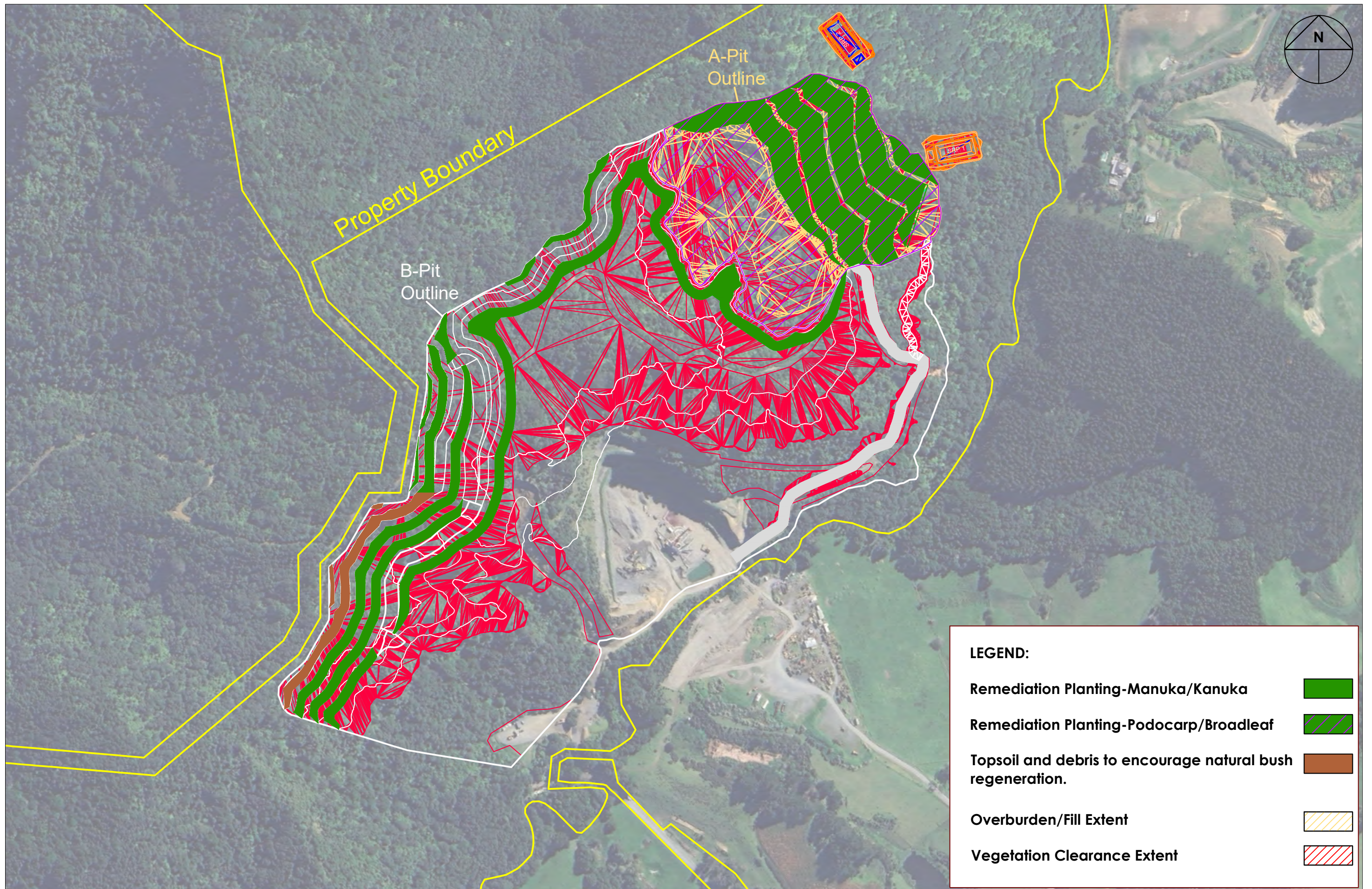


Drawing LA-008 Revision C

Year 16-20

Kings Quarry, Wainui - Stage 2
Landscape Remediation Planting Plans

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Urban & Environmental

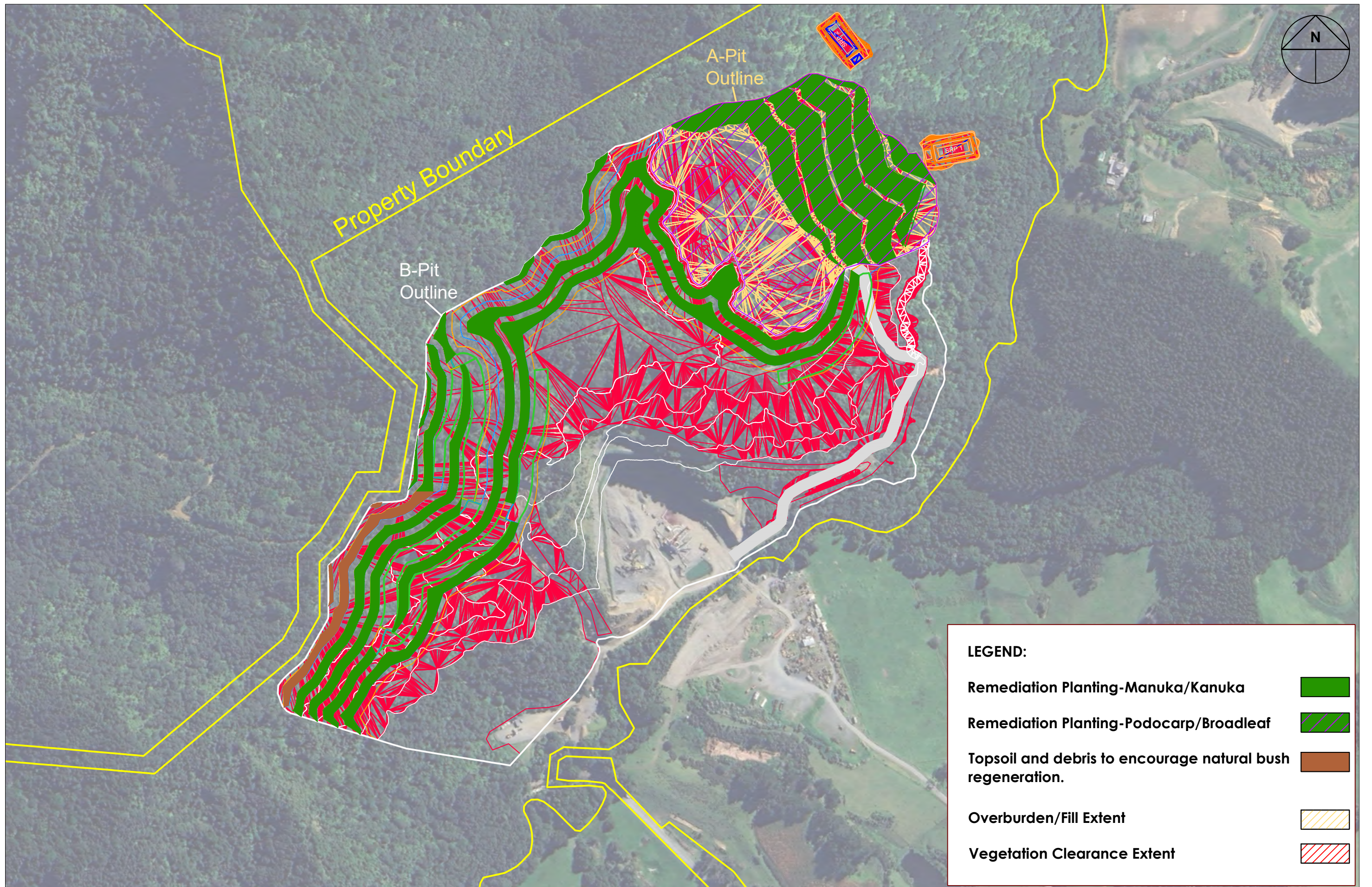


Drawing LA-009 Revision C

Year 21-25

Kings Quarry, Wainui - Stage 2
Landscape Remediation Planting Plans

B&A
Urban & Environmental

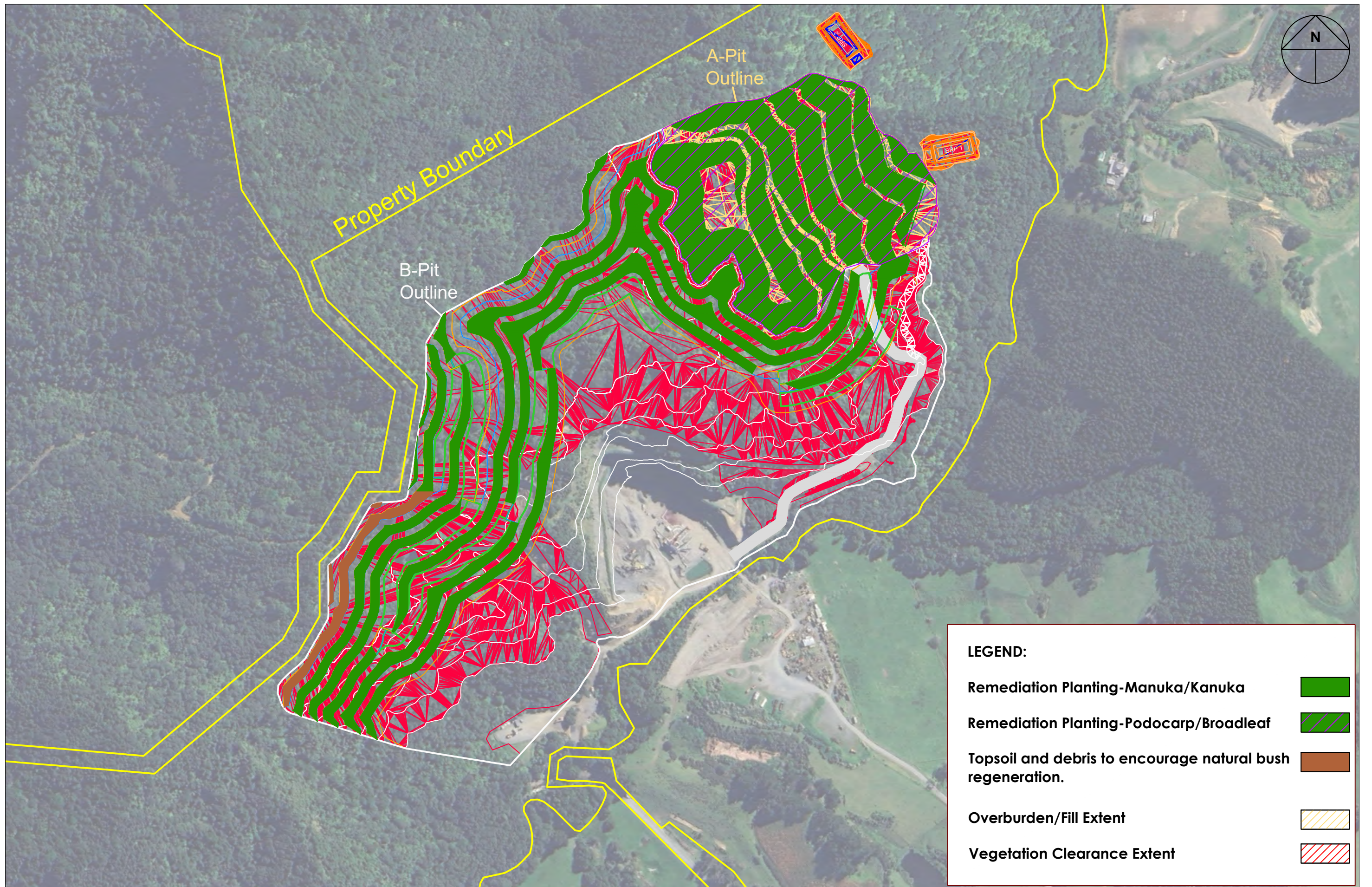


Drawing LA-010 Revision C

Year 26-30

Kings Quarry, Wainui - Stage 2
Landscape Remediation Planting Plans

B&A
Urban & Environmental

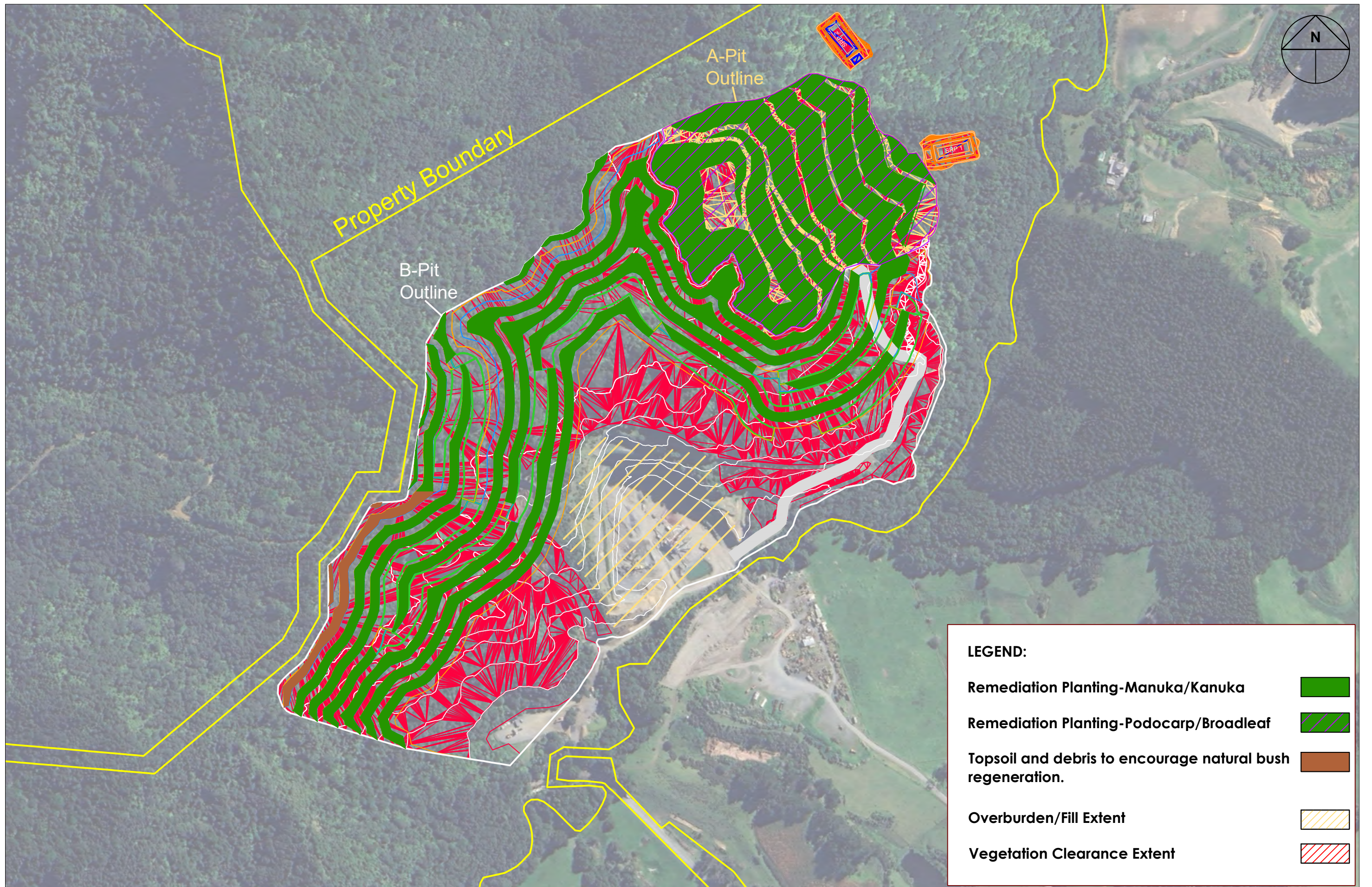


Drawing LA-011 Revision C

Year 31-35

Kings Quarry, Wainui - Stage 2
Landscape Remediation Planting Plans

B&A
Urban & Environmental

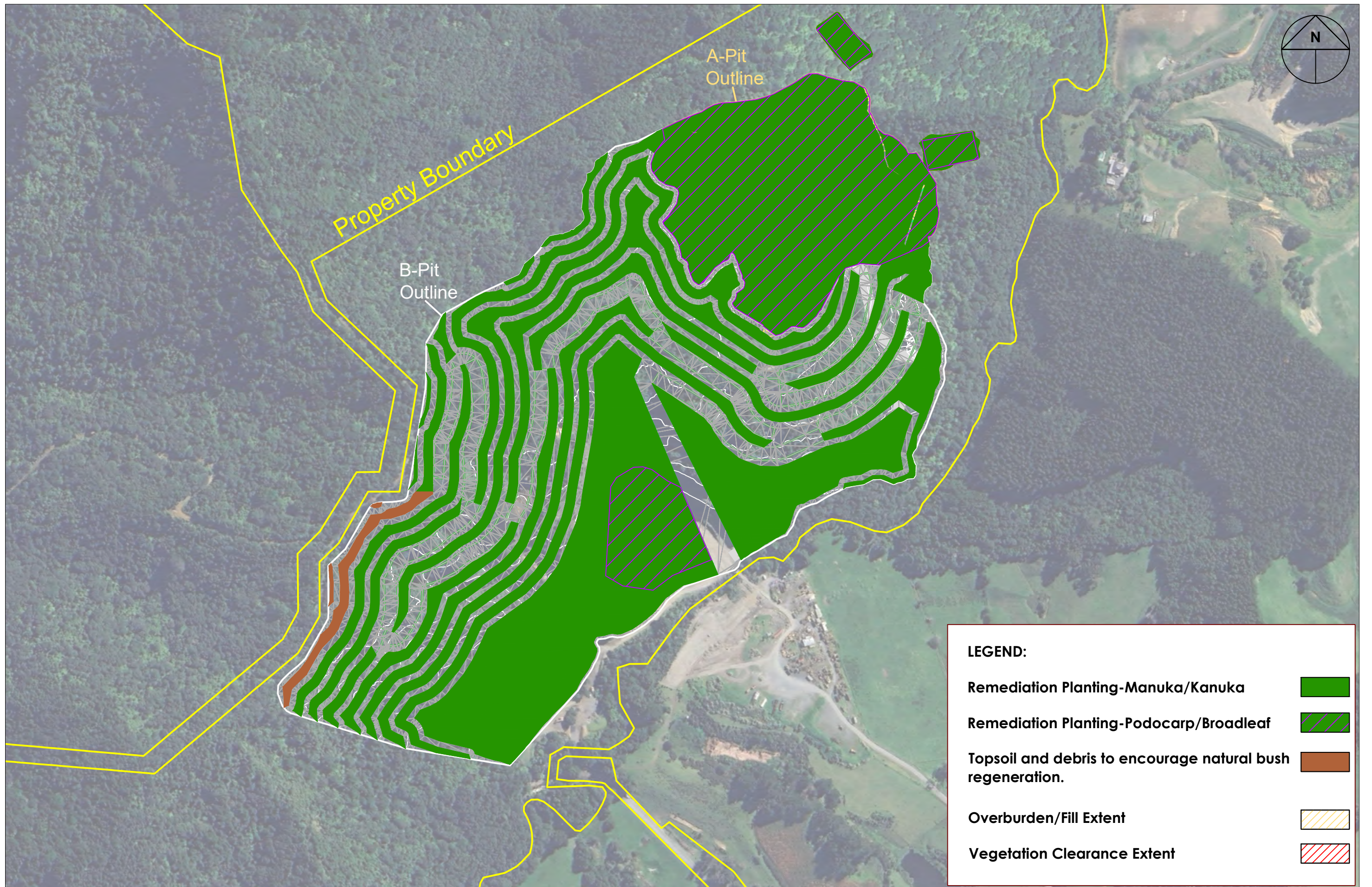


Drawing LA-012 Revision C

Year 36-40

Kings Quarry, Wainui - Stage 2
Landscape Remediation Planting Plans

B&A
Urban & Environmental



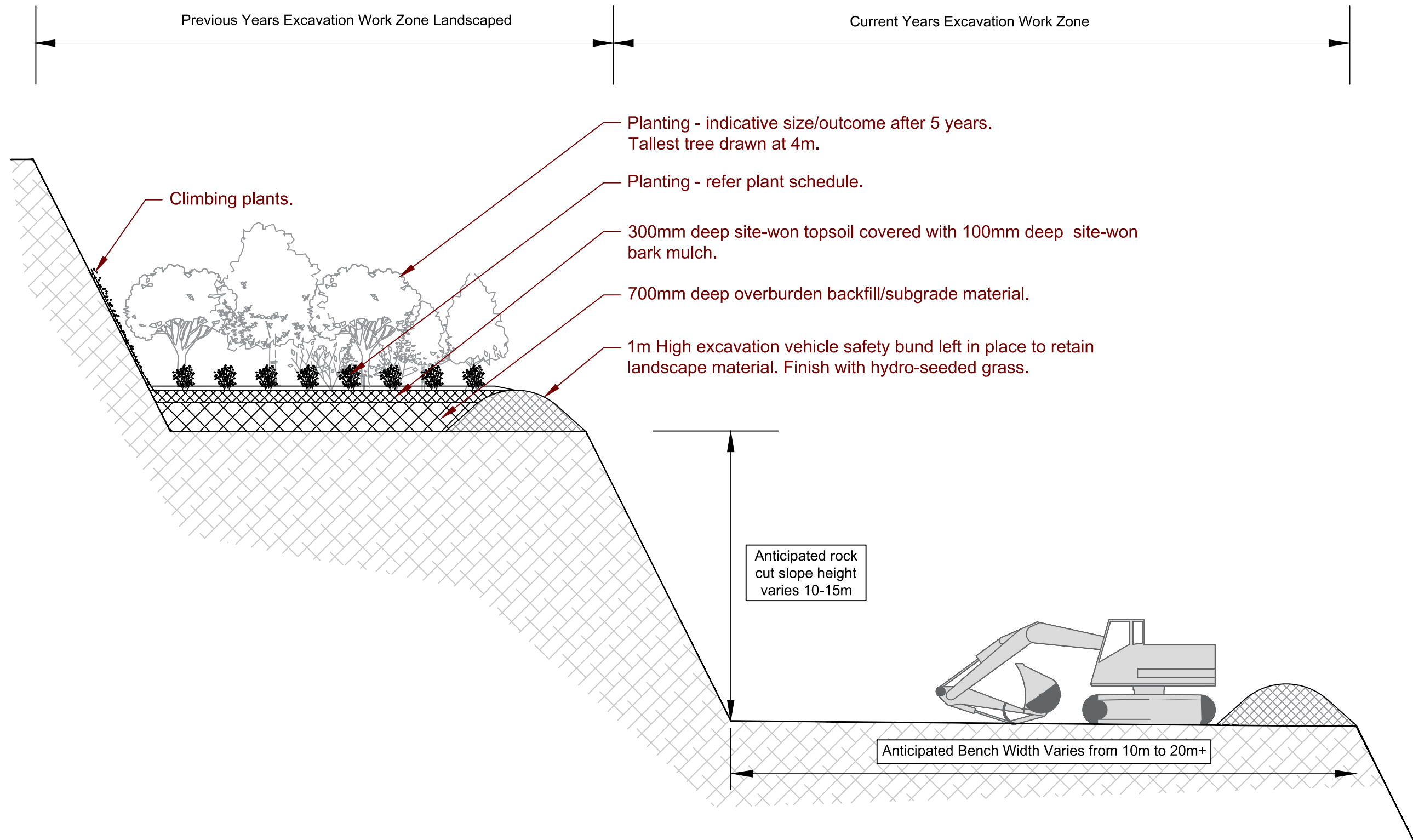
Drawing LA-013 Revision C

Year 41-45

Kings Quarry, Wainui - Stage 2
Landscape Remediation Planting Plans

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Urban & Environmental

Kings Quarry Remediation Planting Mixes										
Plant Information						Approximate Growth Rates				
#	Botanical Name	Common Name	% of Mix	Grade at Planting (L)	Planting Centres (m)	Approx. Height (m) 5yrs	Approx. Height (m) 10yrs	Approx. Height (m) 20yrs	Approx. Height (m) 30yrs	Approx. Height (m) 40yrs
Manuka/Kanuka Dominant Mix (Rock Bench Planting)										
Large Shrubs/Trees										
1	Leptospermum scoparium	mānuka	50%	1	1	2-3	3-4	4-5	6	6
2	Coprosma robusta	karamū	10%	1	1	1-2	4	4	4	4
3	Hoheria populnea	houhere	4%	1	1	2-3	4-5	6	6	6
4	Myrsine australis	māpou	4%	1	1	1-2	3-4	5	5	5
5	Pittosporum tenuifolium	kōhūhū	3%	1	1	2-3	4-5	6	6	6
6	Pittosporum eugeniodes	tarata	3%	1	1	2-3	4-6	8	8	8
7	Knightia excelsa	rewarewa	3%	1	1	1-2	3-5	5-8	10	12
8	Podocarpus totara	tōtara	2%	1	1	1-2	3-4	4-8	10	12
Small Shrubs/groundcovers										
9	Phormium cookianum	wharariki	5%	1	1	1.2	1.2	1.2	1.2	N/A
10	Hebe stricta	koromiko	5%	1	1	1.5	1.5	N/A	N/A	N/A
11	Coprosma propinqua	mingimingi	5%	1	1	1-2	2-3	2-3	2-3	2-3
12	Pennantia corymbosa	kaikōmako	3%	1	1	1-2	2-3	3-4	5	5
13	Pentapogon inaequiglumis	short haired plume grass	3%	1	1	<1	>1	>1	>1	>1
			100%							
Climbers										
14	Metrosideros carminea	Carmine rata	100%	1	Planted every 10m along base of rock faces	<1	1-2	2-3	3-4	6-8
			100%							
Podocarp/Broadleaved Mix (Overburden Fill Areas)										
1	Kunzea robusta	kānuka	15%	1	1	2-3	4-5	6-7	7	7
2	Leptospermum scoparium	mānuka	15%	1	1	2-3	3-4	4-5	6	6
3	Coprosma robusta	karamū	10%	1	1	1-2	4	4	4	4
4	Hoheria populnea	houhere	10%	1	1	2-3	4-5	6	6	6
5	Myrsine australis	māpou	10%	1	1	1-2	3-4	5	5	5
6	Pittosporum tenuifolium	kōhūhū	10%	1	1	2-3	4-5	6	6	6
7	Pittosporum eugeniodes	tarata	10%	1	1	2-3	4-6	8	8	8
8	Knightia excelsa	rewarewa	5%	1	1	1-2	3-5	5-8	10	12
9	Podocarpus totara	tōtara	5%	1	1	1-2	3-4	4-8	10	12
10	Vitex lucens	pūriri	5%	1	1	1-2	4-6	8-10	12	14
11	Alectryon excelsus	tītoki	5%	1	1	1-2	4-6	9-10	12	15
			100%							
N/A = Plant has exceeded its normal life expectancy.										



Drawing LA-015 Revision C

Typical Cross Section - Rock Bench Planting Strategy

Kings Quarry, Wainui - Stage 2
Landscape Remediation Planting Plans

1. LANDSCAPE SITE PREPARATION

Requirements

ARCHAEOLOGICAL DISCOVERY

If fossils, Maori artefacts, antiquities and other items of value are found refer to the general section 1220 PROJECT for actions to be taken with archaeological discovery.

QUALIFICATIONS

Workers to be experienced, competent trades people familiar with the materials and techniques specified. Construction plant and equipment shall only be operated by licensed or experienced operators as appropriate.

QUALIFICATIONS - CHEMICALS

Where chemicals are to be used, staff dealing with and applying the chemical shall hold an appropriate Growsafe Certificate from the N.Z. Agrichemical Education Trust. In addition, for HSNO class 6.1A and B substances, also hold a Certified Handler Compliance Certificate to the Health and Safety at Work (Hazardous Substances) Regulations 2017.

ACCESS FOR MACHINES

Determine working conditions and access for machines. Take into account the time of year, the nature of the ground and subsoil to be excavated, the ground water table and all matters influencing the carrying out of the work. Do not use or park machinery within root zone/drip line of existing trees to be retained.

MYRTLE RUST

For identification and treatment of myrtle rust and the growing, transporting and planting plants in the myrtle family (family Myrtaceae) follow the protocols and precautions of the NZ Plant Producers Inc. (NZPPI) website guidelines: www.nzppi.co.nz/myrtlerust. Any suspected myrtle rust finds must be reported immediately to the Project Administrator. On direction of the Project Administrator immediately notify the Ministry for Primary Industries (MPI) Exotic Pest and Disease Hotline on 0800 80 99 66

Quality control and assurance

INSPECTIONS

Notify the Contract Administrator for inspection of the works following:

- Identification of unsuitable materials requiring removal
- Prior to the placement of any fill material
- At the completion of the Site preparation

Installation/application

MULCH

Mulch felled trees and stumps and stockpile for use in planted areas within the areas to be remediated and import mulch as required.

WEED MATTING

Use a biodegradable 450gsm woven coir weed matting for planted slopes 2H:1V or steeper.

WEED SPRAYING

All work generally to NZS 8409. Spray all vegetated areas to be planted with 2 applications of approved herbicide one week apart, and one week prior to clearing.

Clear or mow any vegetation exceeding 200mm in height prior to application of herbicide. Herbicide shall be applied to cleared or mown areas following sufficient re-growth of the weeds through the mulch as approved by the Contract Administrator.

Planting shall not proceed until at least two weeks after the first application of the residual herbicide, unless prior approval is obtained.

2. SOIL & SOIL PREPARATION FOR PLANTING

Materials

BACKFILLING PLANTING AREAS

Use site-won topsoil to back fill planting areas.

HERBICIDES

Post-emergence selective organic chemical to control broadleaf weeds and/or a non-selective chemical.

Conditions

ENSURE

Ensure that all areas are clean, ready to be worked and clear of any continuing work by others.

Application

PREPARATION OF PLANTING AREAS

Thoroughly spray planting areas which contain weed growth with a non-selective herbicide.

TOPSOIL SPREADING

Spread site-won soil to the compacted depth of 300mm in all planting areas. Do not place and spread topsoil when the ground or topsoil are excessively wet or in a condition which would be detrimental to the work.

FINAL GRADING

When topsoil is reasonably dry and workable, grade it to smooth, flowing contours, with falls, for adequate drainage, removing all minor hollows and ridges.

3. PLANTING

Requirements

QUALIFICATIONS

Landscape contractors to be experienced, competent landscapers familiar with the materials and techniques specified.

Quality control and assurance

INSPECTIONS

- Contract Landscape Architect to inspect all plants before planting. They shall be inspected on delivery to site in a single batch. Any plant not approved by the Contract Administrator shall be replaced at the cost of contractor.
- Plants to be first class specimens of nursery stock, true to name and type with well-developed and well-shaped trunk or stem and head. They shall be well hardened off to cope with the climatic conditions of the site, and free from pests and disease.

- The roots shall have a high percentage of fibrous roots that are just touching the edge of their containers. Plants with roots that are wound round their containers in circular fashion shall be rejected.
- Plants shall be free from disfiguring knots, bark abrasions, wind, or freezing injury or other disfigurements and shall bear evidence of proper pruning.

IDENTITY

Plants to be Eco-sourced from the Rodney Ecological District. Plants should be good and true representatives of their species, cultivar or variety and each batch shall be labelled.

LABELLING

Attach legible labels to each plant delivered to site as a separate unit, or to each box, bundle or bale containing plants. The labels shall give the approved botanical name, size, age and quantity and other information required to identify the plant or plants.

PLANTER BAGS

Litre (L) grade bags and/or containers or UV stabilised black plastic bags (PB).

HEALTH

Ensure plants are free of pests, diseases, disorders, disfiguring knots damage or pruning injury.

MYRTLE RUST

For identification and treatment of myrtle rust and the growing, transporting and planting plants in the myrtle family (family Myrtaceae) follow the protocols and precautions of the NZ Plant Producers Inc. (NZPPI) website guidelines: www.nzppi.co.nz/myrtlerust.

Ensure:

- Plants from a commercial nursery have the appropriate completed copies of the NZPPI Nursery Management Declaration form and Plant Transport Declaration form.
- Treatment records are provided for non-commercially sourced plants
- Myrtaceous plants are within the effective period of cover for the treatment used at time of dispatch (different treatments and cover periods are on the NZPPI website).
- Any suspected myrtle rust finds must be reported immediately to the Project Administrator. On direction of the Project Administrator immediately notify the Ministry for Primary Industries (MPI) Exotic Pest and Disease Hotline on 0800 80 99 66.

Conditions

DELIVERY, STORAGE AND HANDLING

- Take delivery of materials and goods and store on site and protect from damage.
- Cover plants during transportation. Plant roots shall be protected at all times from sun or drying winds. Plants that cannot be planted immediately on delivery shall be kept in the shade, well protected, with soil well watered.
- If shoots or roots suffer slight damage they shall be carefully pruned and treated with an approved fungicidal sealant. Replace damaged plants.
- Remove pots and other protective materials immediately prior to planting. Do not leave roots uncovered at any time.

APPROVAL

Do not start preparation or planting until the setting out has been inspected and approved by the Contract Landscape Architect.

PRE-INSTALLATION REQUIREMENTS

Prepare all planting areas indicated on the drawings including clearing out, controlling weeds, forming new planters, cultivating, and adding soil conditioner, fertiliser and bark mulch.

CLEAN OUT PLANTER AREAS

Remove weeds, unwanted plants, stumps, rubbish, and excess earth.

FINISHED SURFACE LEVELS

The finished surface soil level (excluding mulch or weed mat) shall be 50mm higher than adjacent building platform, at the edge of the planting area.

MARKING & DIMENSIONS

Set out the outlines of planting areas. Use sand, paint or short canes close enough together to accurately define the shapes on the ground.

Installation/application

PLANT LAYOUT

Plant layout as per drawings. Place and plant at the same density throughout that species area, group or drift. Do not plant in regular rows unless this is shown on the drawings. Pay particular attention to the distribution of plants around the perimeter of areas to ensure they are evenly spaced and that the front row of plants follows the shape of the area.

PRUNING

Prune any damaged or diseased roots and branches.

PLANT POSITIONING

Place plants in the centre of the planting pit with their main stem vertical and at such a depth that the firmed down soil after planting is at the same height as the nursery ground level or the container soil level.

Remove container from container grown plants immediately prior to planting. Take care to ensure that the root ball is not disturbed during container removal or planting.

Set plants in their final positions with main stem vertical and at such a depth that the soil, when firmed down is at the same height as the nursery earth marks on the stem or the container soil level. Spread out loose roots in a natural fashion, carefully place the soil under and amongst them to fill all voids and firmed in.

BACKFILL

Back fill planting areas with site-won topsoil. Filling should be done in 150mm layers, consolidating firmly to eliminate air pockets. The final backfill shall be at a height that will allow for settlement.

FERTILISER TABS

Add a single general purpose fertiliser tab to each plan hole before installing each plant.

WATERING

All plants shall be thoroughly watered a few hours prior to planting, and again immediately after planting.

Water the installed plants to the level required for the season the planting is programmed to be installed. Additional watering will be required during the drier seasons.

Attention must be paid to watering during and after planting to ensure successful establishment.

PLANT SHELTERS

Install plant shelters for each plant to protect from wind.

Completion

ROUTINE CLEANING

Carry out routine trade cleaning of this part of the work including periodic removal of all debris, unused materials, and elements from the site.

Commissioning

FINAL INSPECTION AND TESTING

To be carried out by the Landscape Architect with the landscape sub-contractor.

HANDOVER

To be carried out by the Landscape Architect with the landscape sub-contractor.

4. LANDSCAPE MAINTENANCE

Requirements

QUALIFICATIONS

Workers to be experienced, competent landscape people familiar with the materials and techniques specified.

PERIOD

For each completed area of remediation planting undertake regular maintenance of the landscaping works regularly for:

Years 1-2 Commencing from Practical Completion.

For each completed area of remediation planting undertake reduced maintenance of the landscaping works regularly for:

Years 3-4 Commencing from end of above maintenance period

The degree required and frequency is detailed below in tables 1 and 2.

Quality control and assurance

NOTIFICATION OF MAINTENANCE VISITS AND FREQUENCY

Maintenance visits shall we carried out as per MAINTENANCE SCHEDULE FOR PLANTING for the entire maintenance period. Supply to the Contract Administrator a maintenance schedule detailing the dates of proposed visits and work to be undertaken.

Maintenance

GENERAL

Maintenance shall include watering, weed removal, plant trimming, cultivation, insect and disease control, pruning and other accepted horticultural operations to ensure normal and healthy plant establishment and growth.

inspect the landscaping works as outline in EXECUTION section below to confirm the health of the plants, existence of pests, diseases, or vandalism.

Ensure that the plants installed will survive and grow. Water the plants installed as frequently as necessary.

Execution

WATERING

For the first year after planting, monitor trees, shrub and grass planting areas on a minimum monthly basis (or more often during drier periods) for symptoms of water stress and provide additional watering as necessary.

Do not water during the hot part of the day and adjust the watering periods as necessary to accommodate seasonal fluctuations.

When deemed required, shrub and grass planting shall be watered using watering nozzles with a fine rose or sprinkler head to prevent damage to growth areas of the plants. This shall be carried out at monthly intervals (or more often during dry conditions) to ensure successful plant establishment and growth.

WEED CONTROL

Visits required as per MAINTENANCE SCHEDULE FOR PLANTING.

Spaying of weeds with an approved organic herbicide with all necessary safety precautions may be required for persistent weeds. Apply herbicide by spot spraying using a protective spray nozzle/cone. Selective weed sprays may be used in appropriate circumstances.

NOXIOUS PESTS AND DISEASES

Monitor the works for insect and plant disease problems. If present, identify the problem and apply appropriate remedy by accepted horticultural practice.

Take all suitable precautions for the safe handling and application of herbicides, fungicides and insecticides and use these strictly in accordance with the manufacturer's specifications. In all cases, apply sprays on windless days.

PROTECTION OF TREES AND STRUCTURES

Avoid damage to existing and newly planted trees during cutting or trimming operations. Trim or cut using small appliances (weed-eater or hand mower) for a minimum diameter of 1.0m from the trunk, to avoid ring barking by larger appliances.

Shrubs and Ground Cover

OPERATIONS - SHRUBS AND GROUND COVER

Maintain planting beds to establish good plantings, and achieve a high level of lush vegetation with visual impact. Maintenance shall include weed control, trimming, and watering. Ground cover plants should grow to fully cover the ground and thus reduce weed growth and maintenance. Maintain planting beds to a neat and tidy appearance to at least the same condition as at Practical Completion.

TRIMMING

Undertake regular trimming of shrubs to maintain the following aspects:

- Removal of dead heads after flowering
- Removal of dead or old weak growth
- Cutting back to encourage growth vigour
- Thinning out mass planted areas to allow stronger plants to dominate

Completion

ROUTINE CLEANING

Carry out routine trade cleaning of this part of the work including periodic removal of all cuttings, trimmings, debris and elements from the site.

HERBICIDE

- Type: EnviroChem Organic Weed Killer (or approved organic substitute)
- No. of applications:As per supplier instructions - refer attached spec sheet

REPLACEMENT TREES & PLANTS

Replacement trees and plants shall be installed as per the construction drawings. Overall plant survival rate achieved should be 90%.

Table 1. MAINTENANCE SCHEDULE – NEWLY COMPLETED AREA OF PLANTING

Year	Weed Spray	Trimming / Pruning	Plant Shelter Inspection	Watering	Mulch Topped-up	Replacement
1	3 Monthly	As required	3 Monthly	As required	As required	As required
2	6 monthly	As required	6 Monthly and remove if overgrown by plant.	As required	N/A	As required

Table 2. MAINTENANCE SCHEDULE – COMPLETED AREA OF PLANTING YR3 ONWARDS

Year	Weed Spray	Trimming / Pruning	Plant Shelter Inspection	Watering	Mulch Topped-up	Replacement
3	Annually	As required	Remove plant shelters	N/A	N/A	As required
4	Annually	As required	N/A	N/A	N/A	N/A
5-45	N/A	N/A	N/A	N/A	N/A	N/A

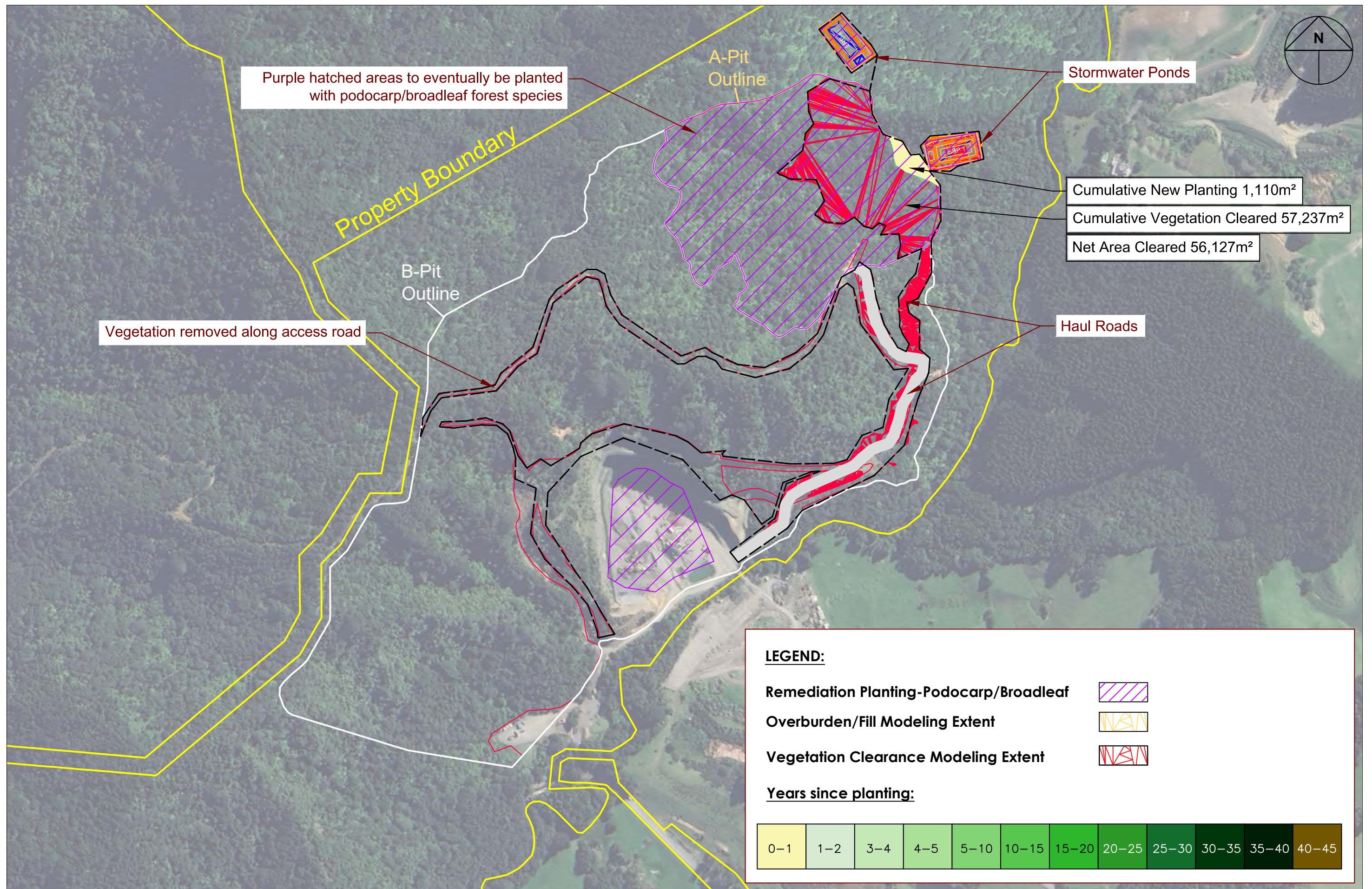


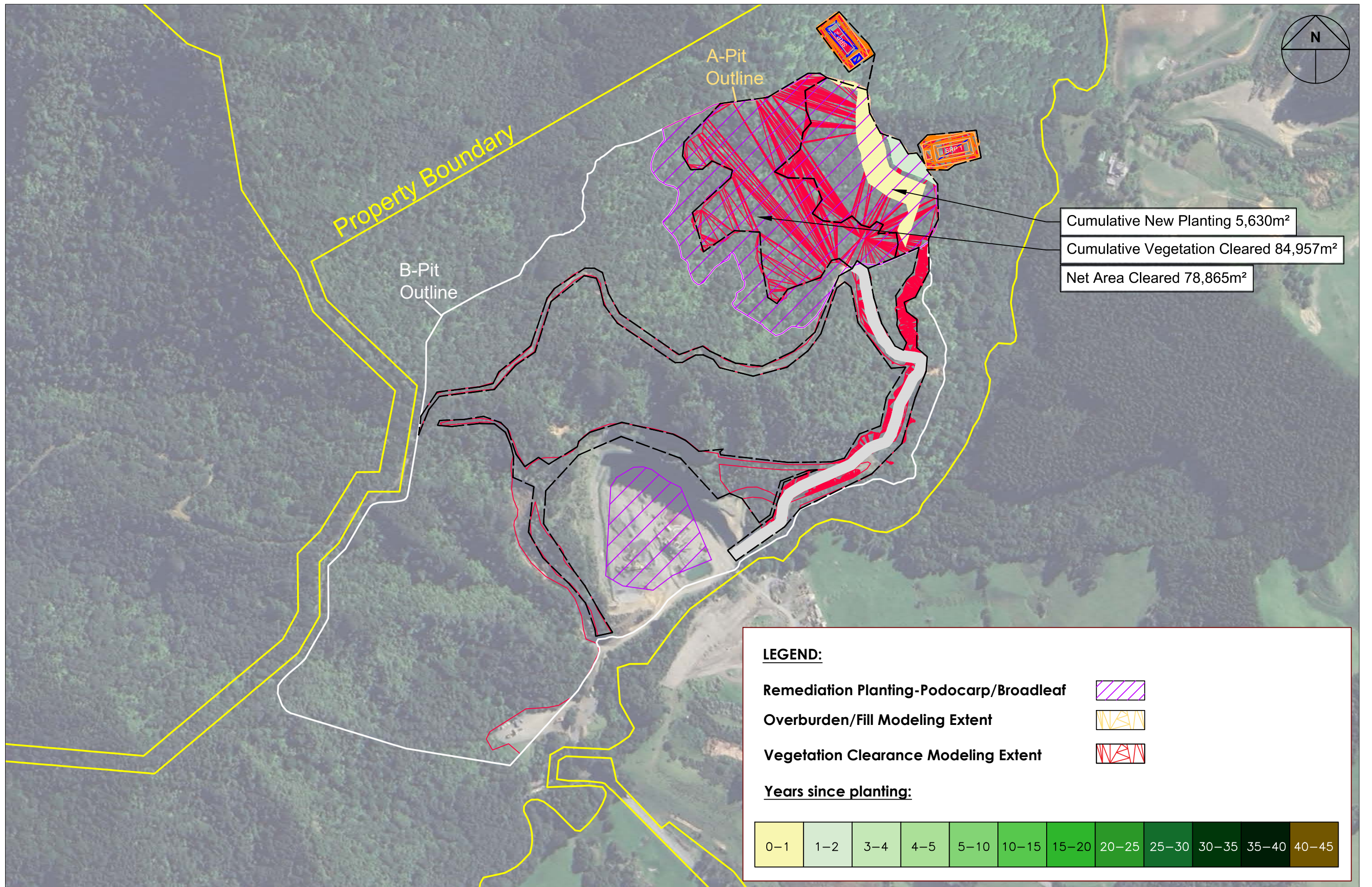
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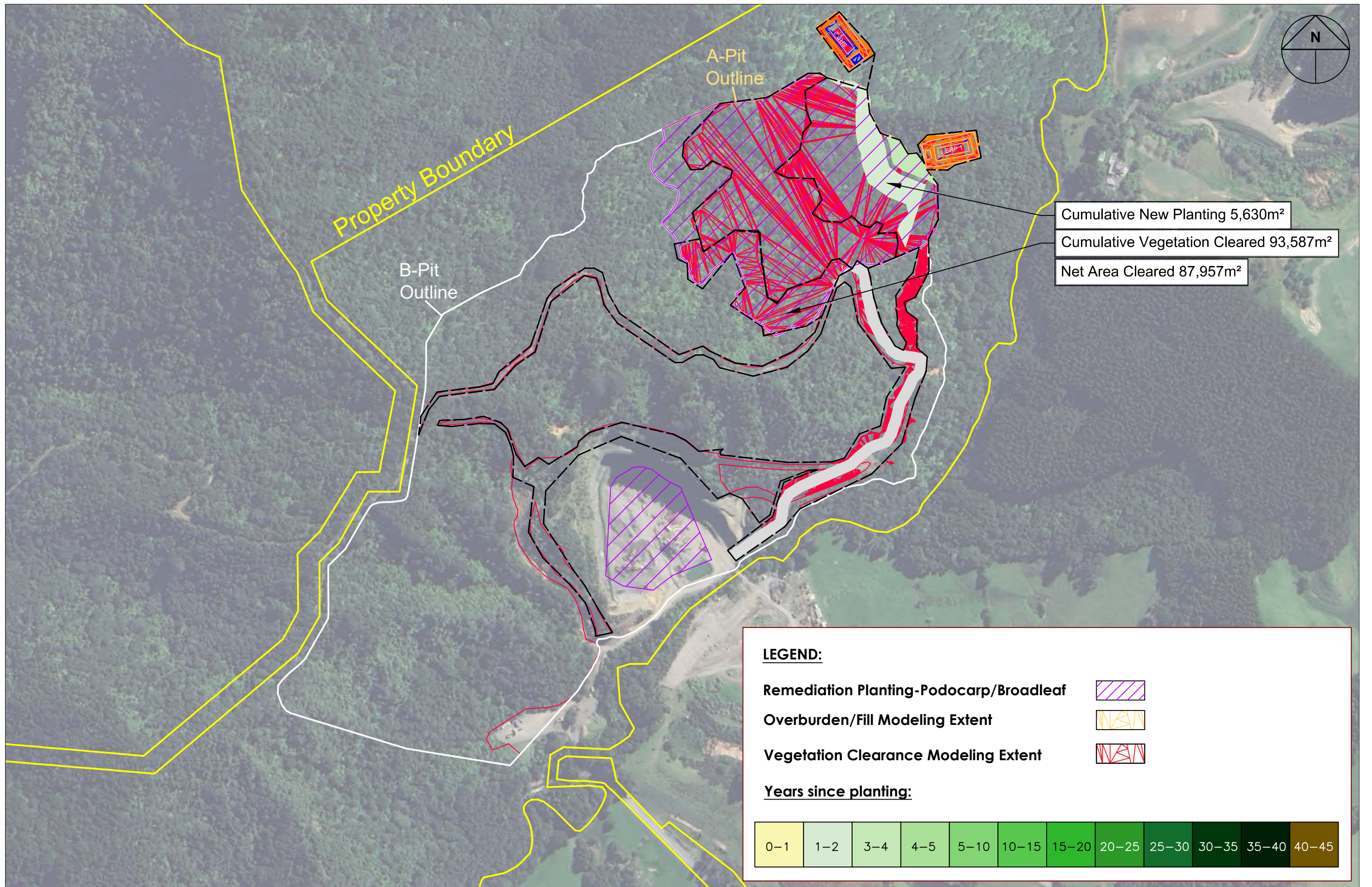
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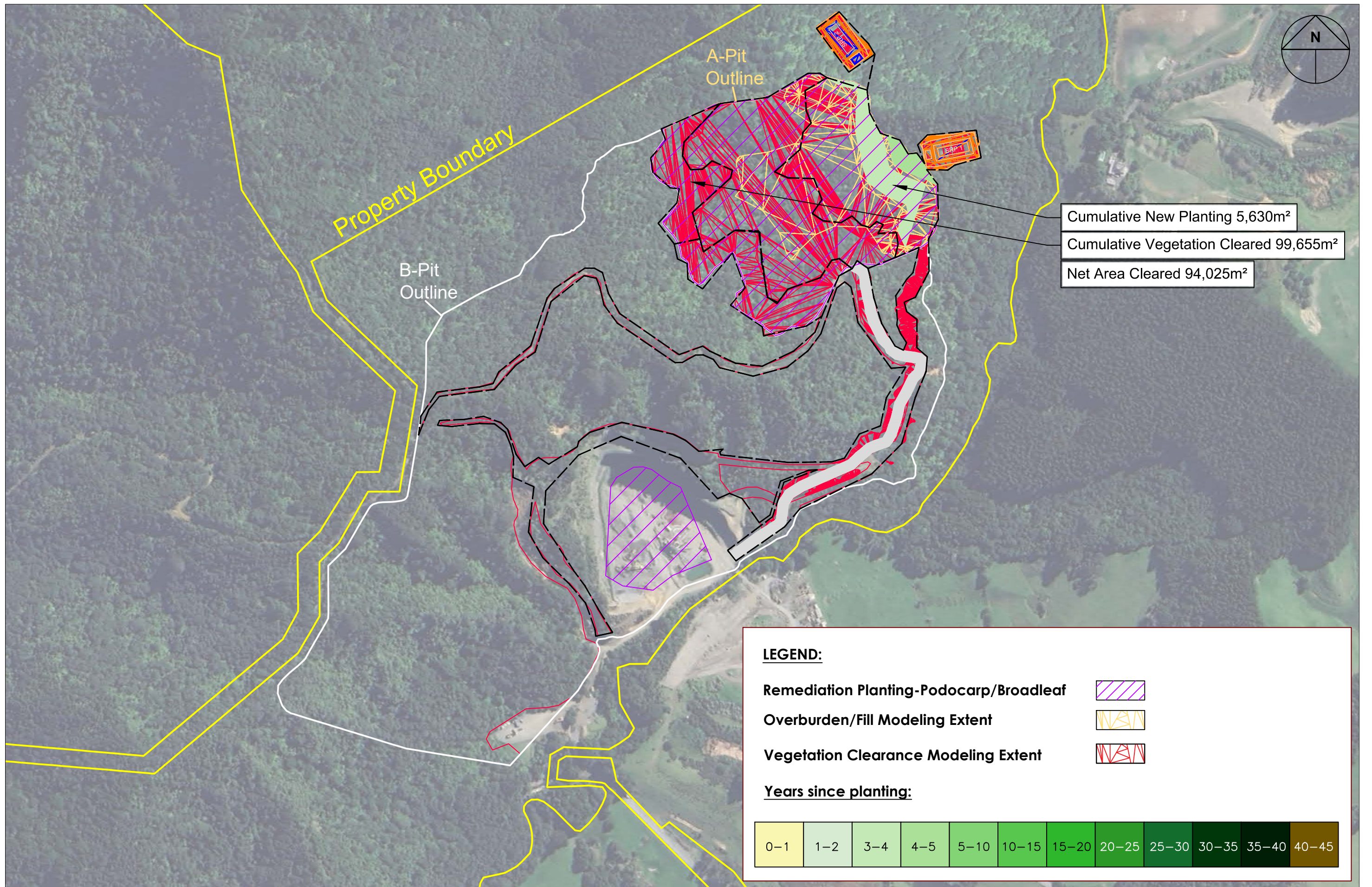
Kings Quarry, Wainui - Stage 2
Ecological Planting Plans

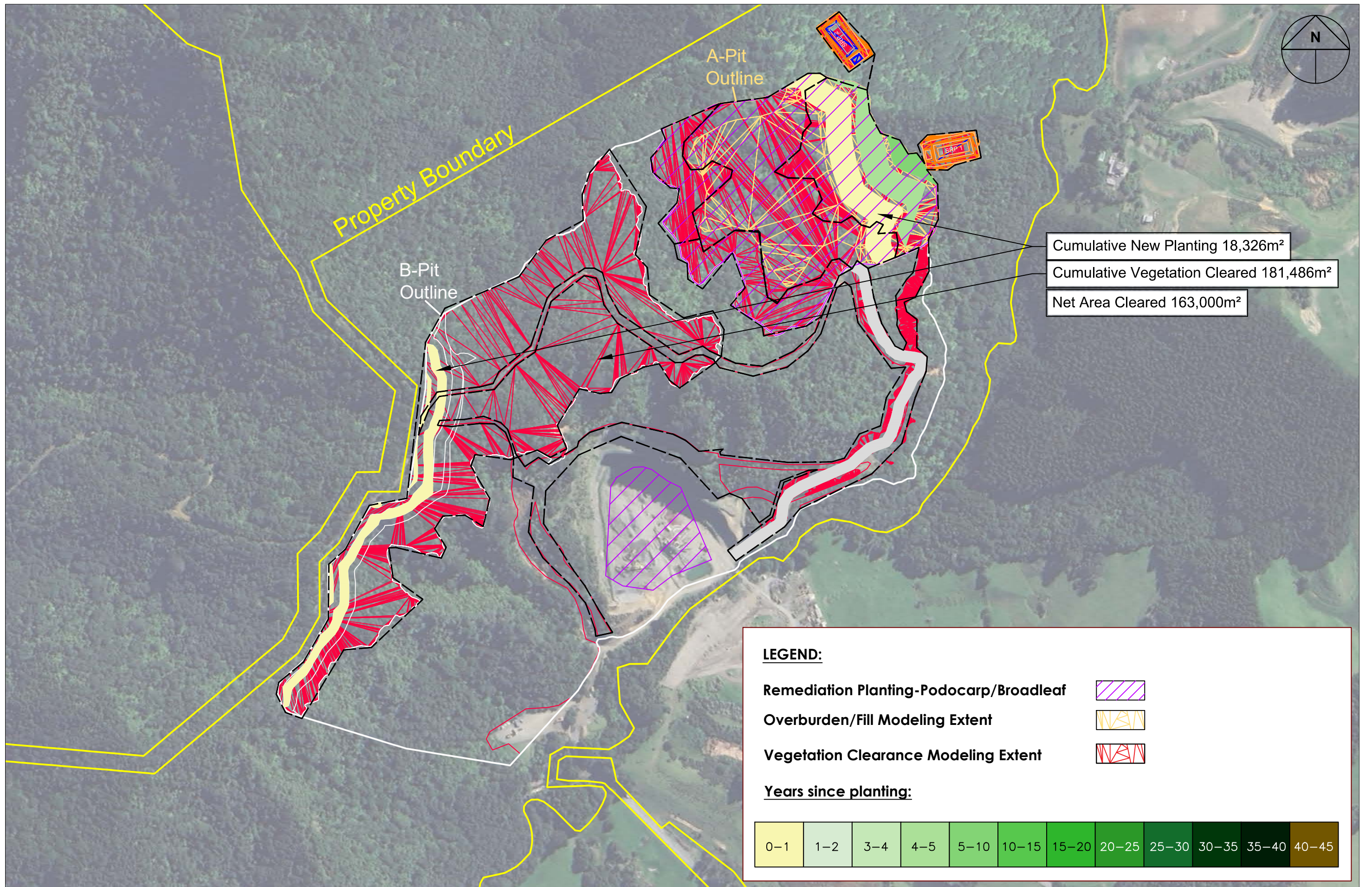
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Urban & Environmental

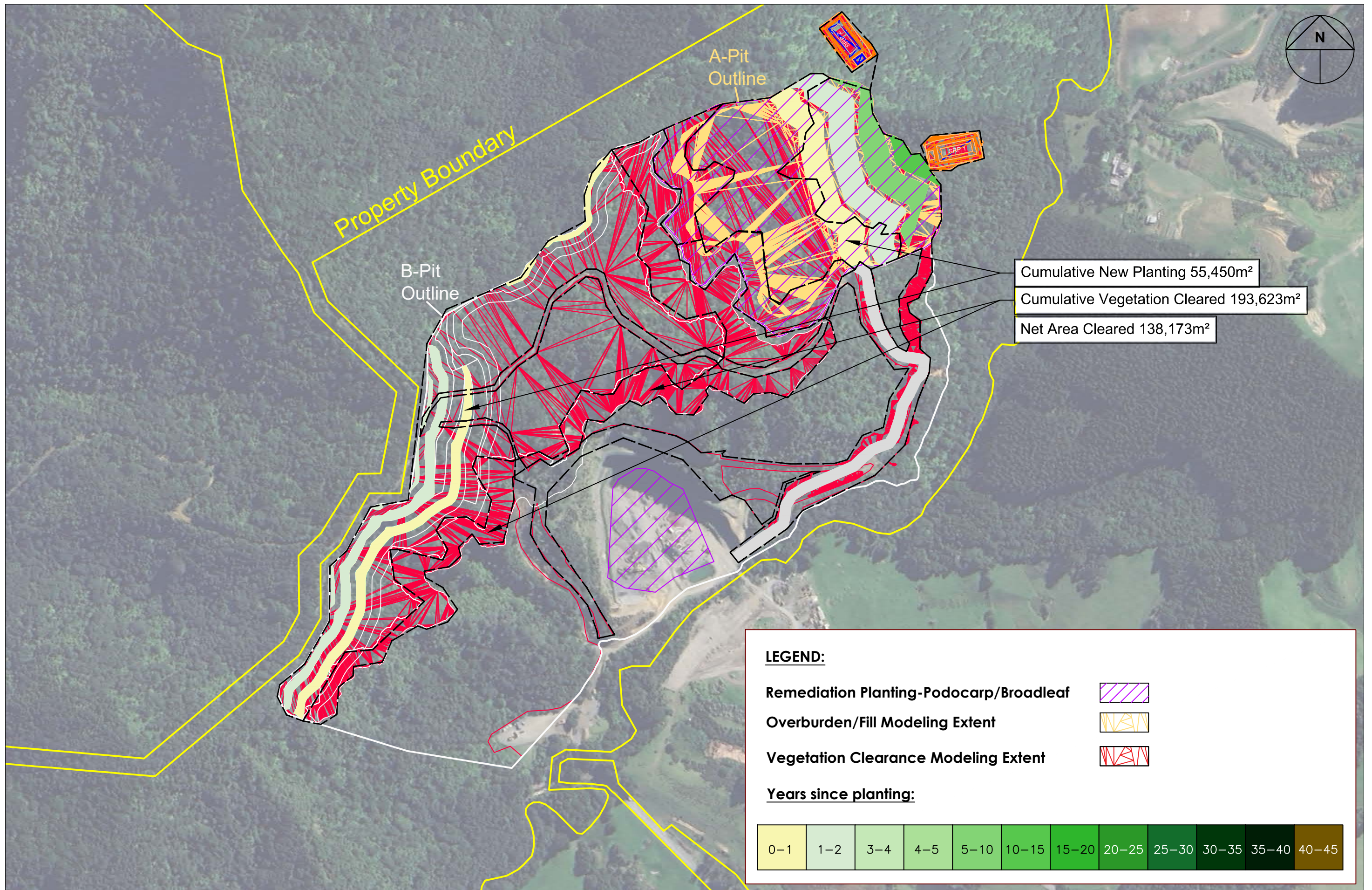


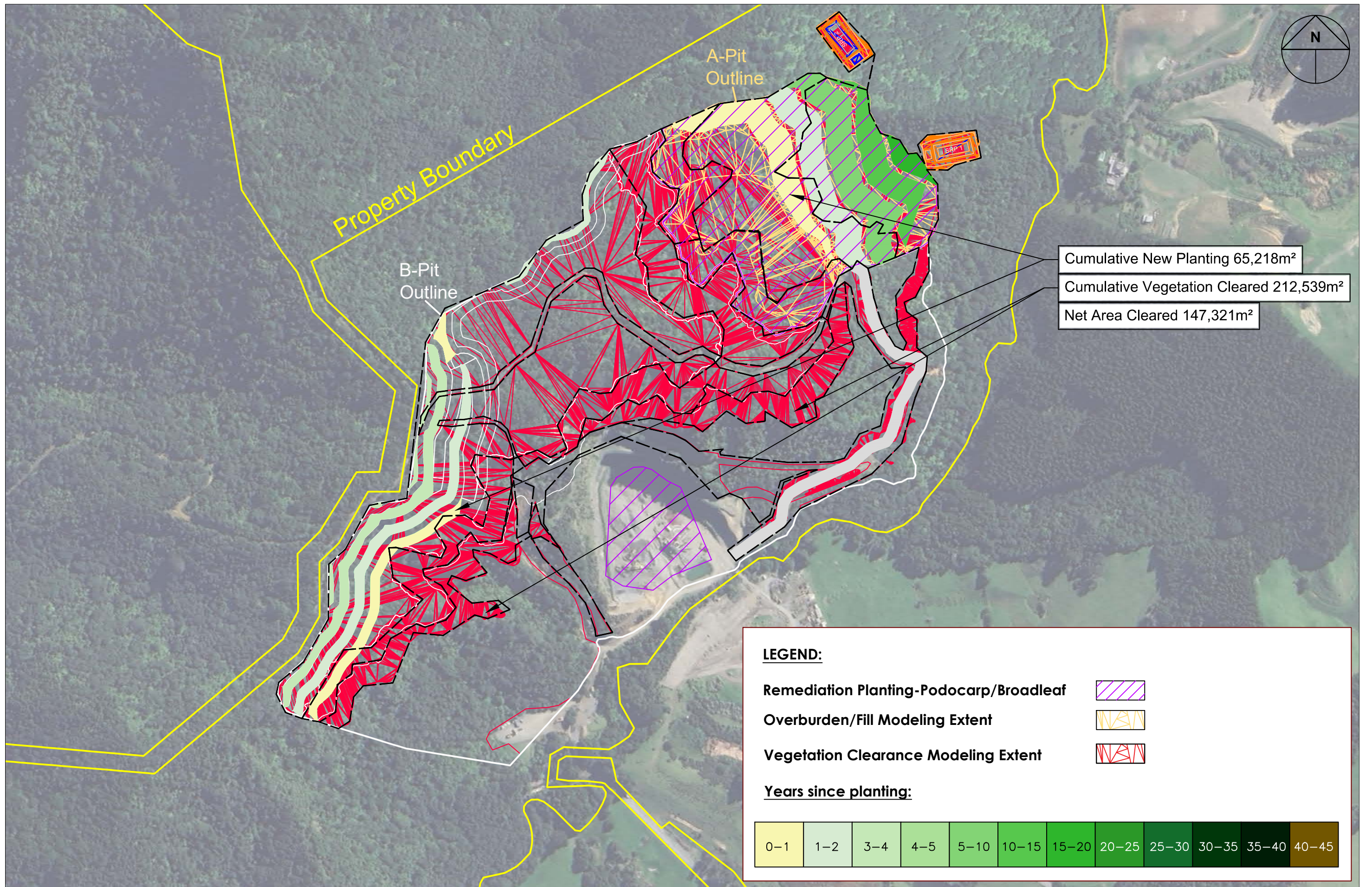


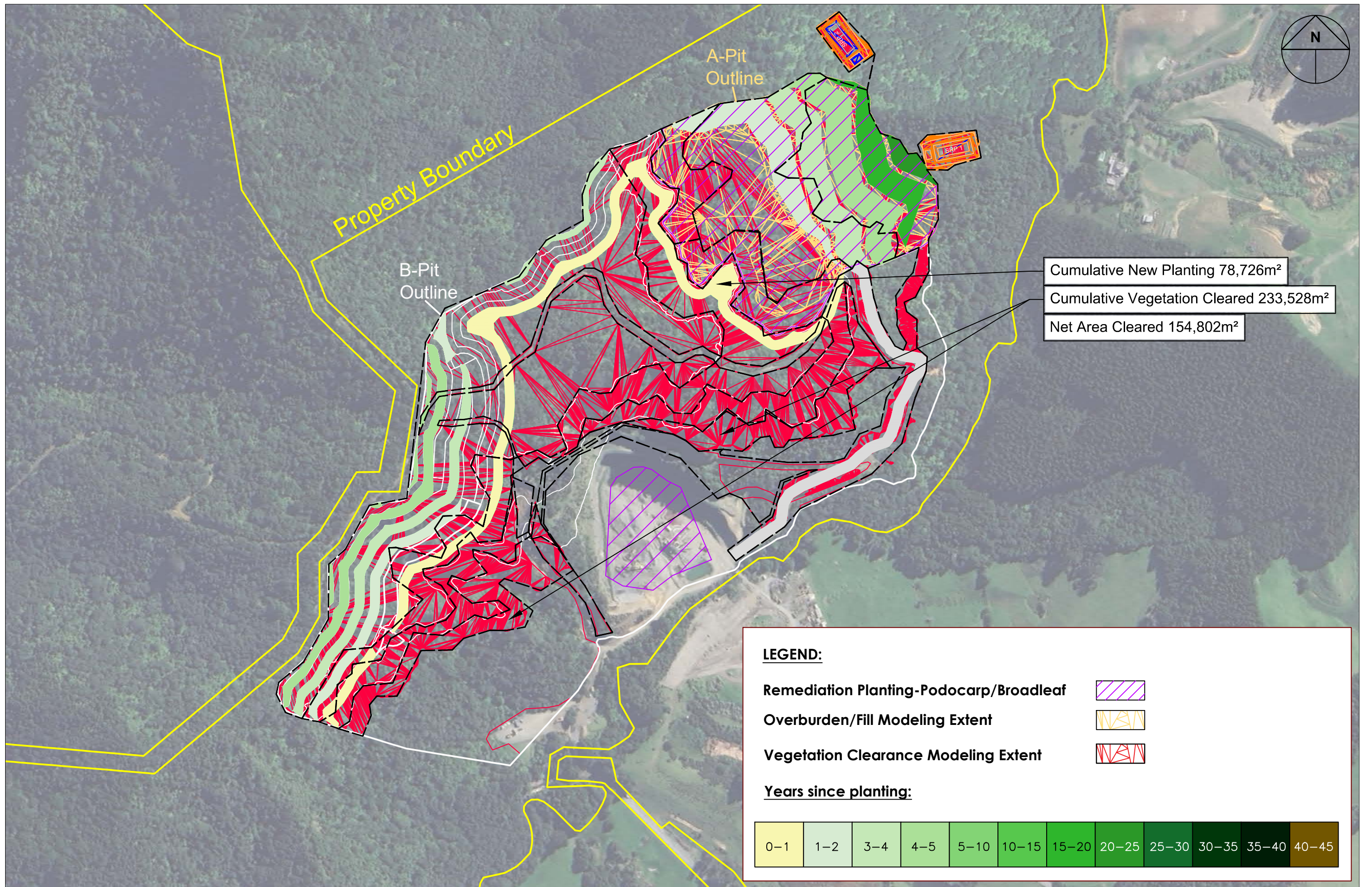


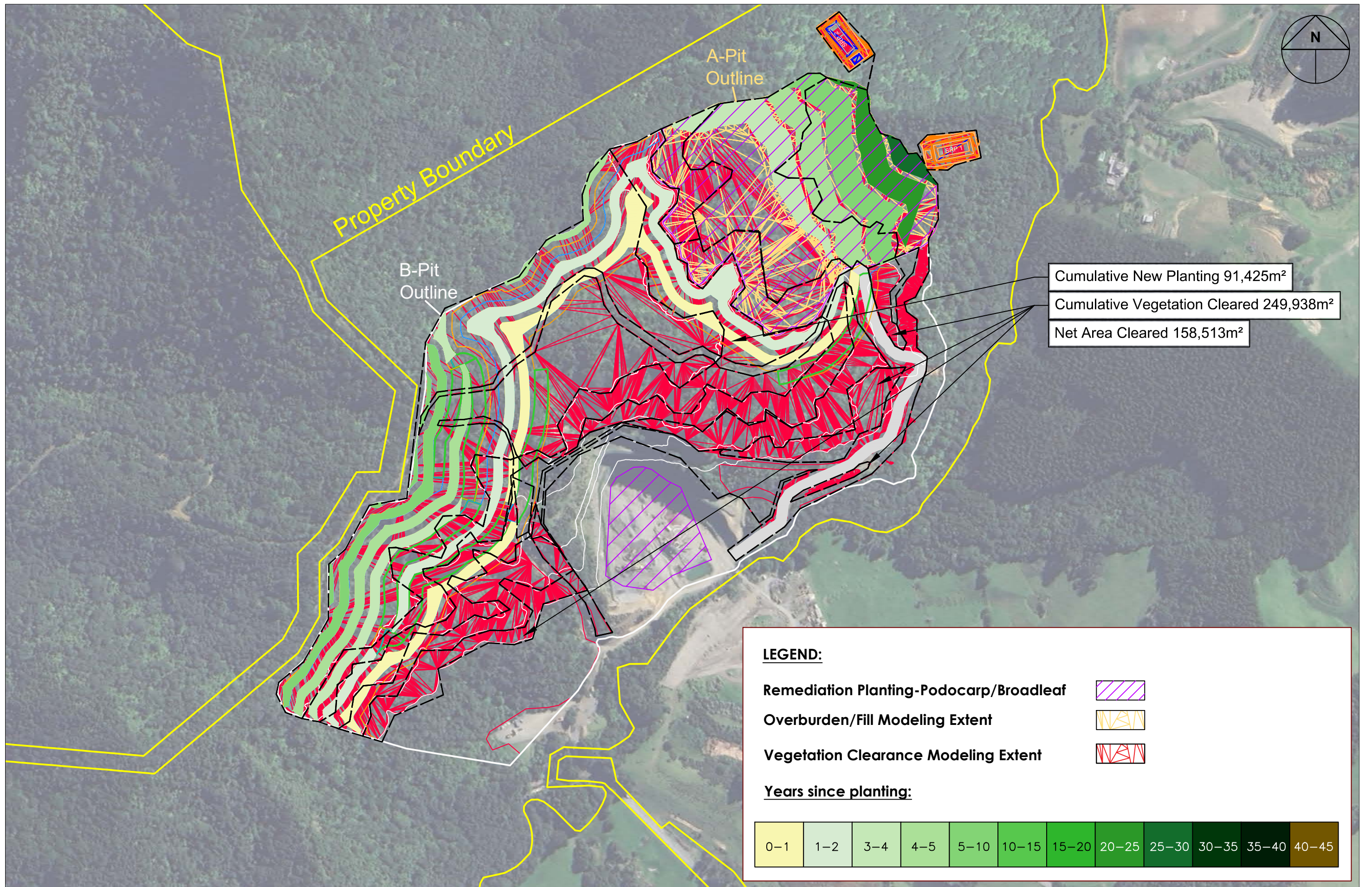


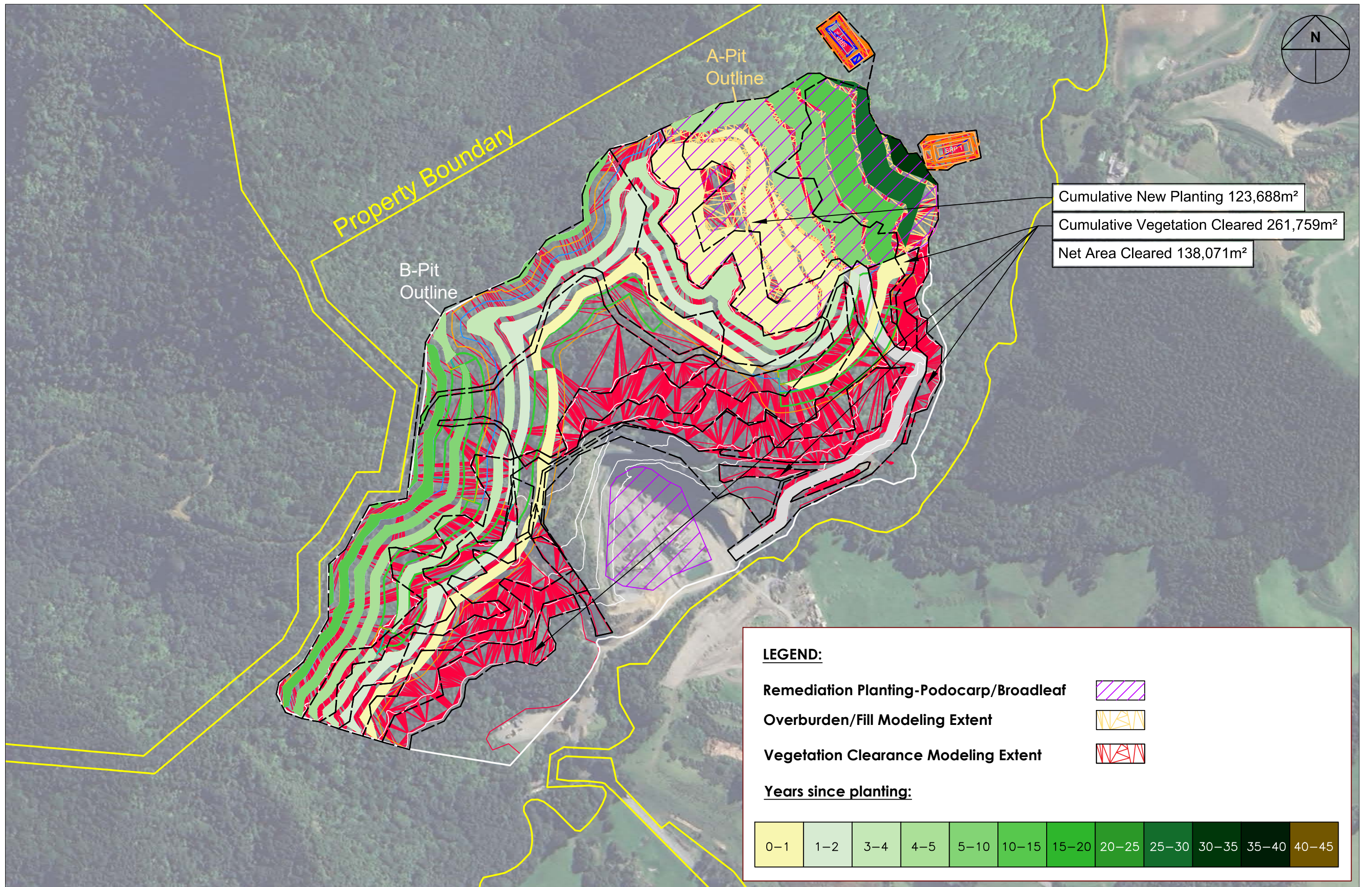


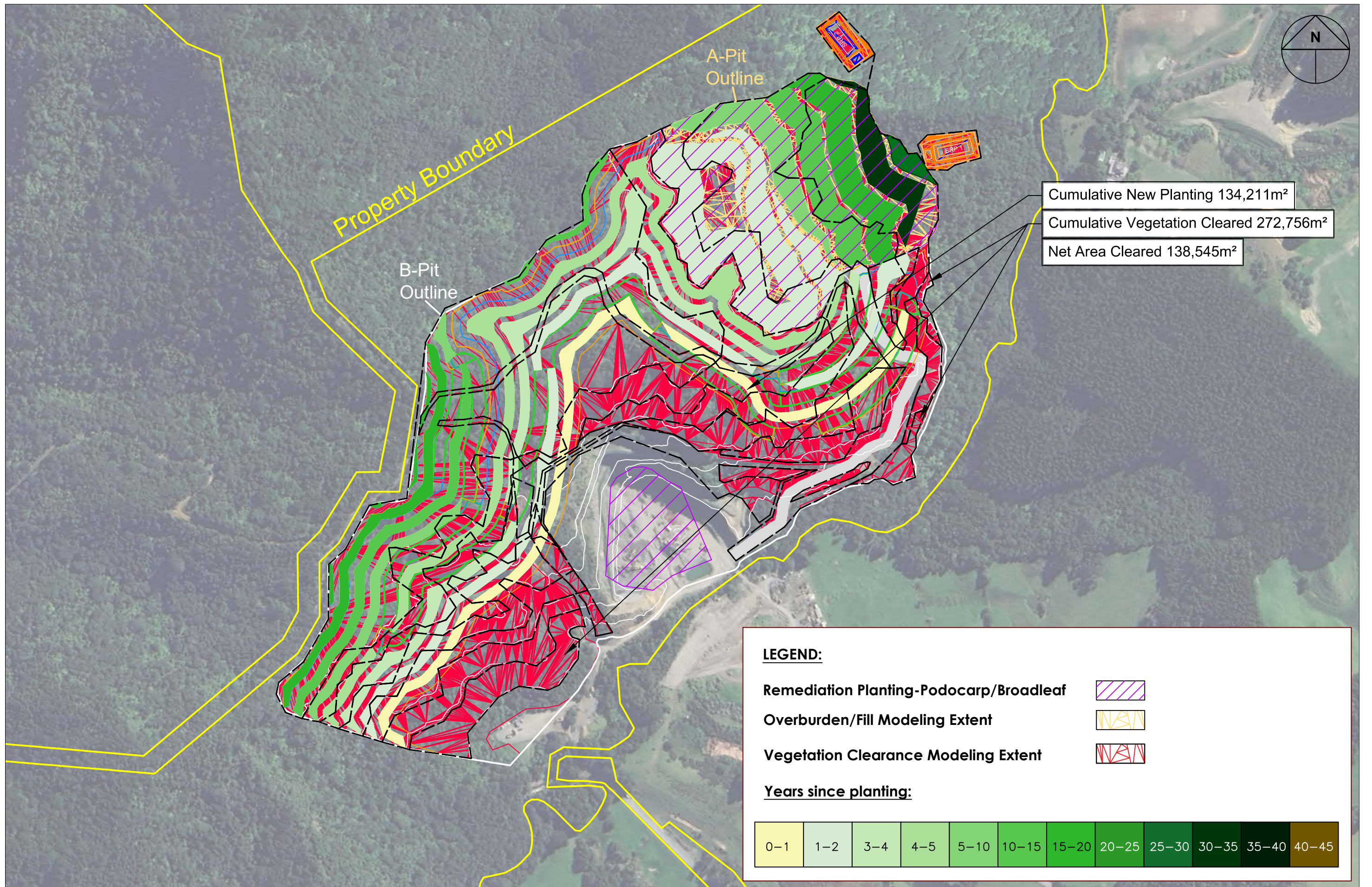


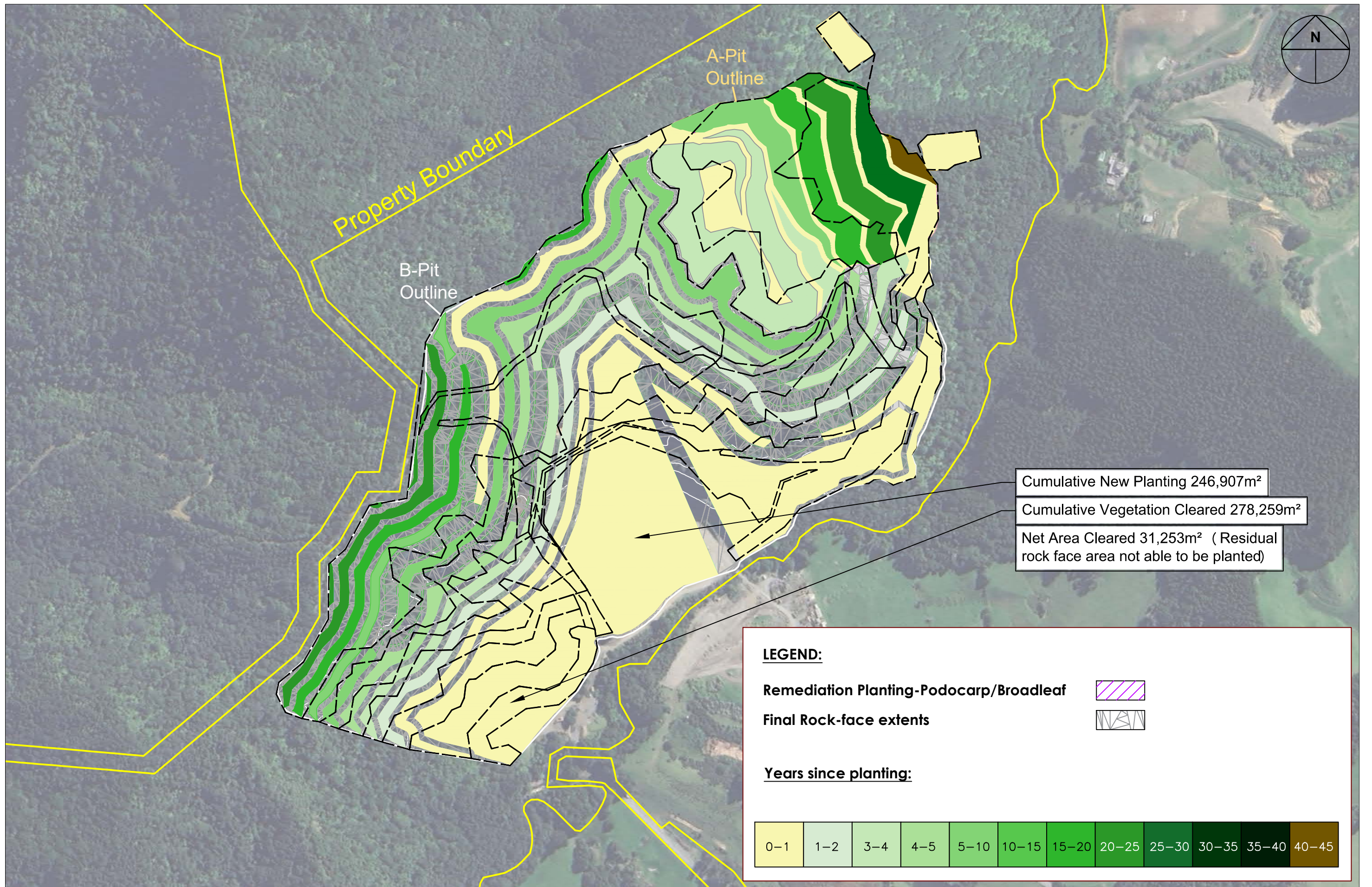












Kings Quarry Remediation Planting Mixes										
Plant Information						Approximate Growth Rates				
#	Botanical Name	Common Name	% of Mix	Grade at Planting (L)	Planting Centres (m)	Approx. Height (m) 5yrs	Approx. Height (m) 10yrs	Approx. Height (m) 20yrs	Approx. Height (m) 30yrs	Approx. Height (m) 40yrs
Manuka/Kanuka Dominant Mix (Rock Bench Planting)										
Large Shrubs/Trees										
1	Leptospermum scoparium	mānuka	50%	1	1	2-3	3-4	4-5	6	6
2	Coprosma robusta	karamū	10%	1	1	1-2	4	4	4	4
3	Hoheria populnea	houhere	4%	1	1	2-3	4-5	6	6	6
4	Myrsine australis	māpou	4%	1	1	1-2	3-4	5	5	5
5	Pittosporum tenuifolium	kōhūhū	3%	1	1	2-3	4-5	6	6	6
6	Pittosporum eugeniodes	tarata	3%	1	1	2-3	4-6	8	8	8
7	Knightia excelsa	rewarewa	3%	1	1	1-2	3-5	5-8	10	12
8	Podocarpus totara	tōtara	2%	1	1	1-2	3-4	4-8	10	12
Small Shrubs/groundcovers										
9	Phormium cookianum	wharariki	5%	1	1	1.2	1.2	1.2	1.2	N/A
10	Hebe stricta	koromiko	5%	1	1	1.5	1.5	N/A	N/A	N/A
11	Coprosma propinqua	mingimingi	5%	1	1	1-2	2-3	2-3	2-3	2-3
12	Pennantia corymbosa	kaikōmako	3%	1	1	1-2	2-3	3-4	5	5
13	Pentapogon inaequiglumis	short haired plume grass	3%	1	1	<1	>1	>1	>1	>1
			100%							
Climbers										
14	Metrosideros carminea	Carmine rata	100%	1	Planted every 10m along base of rock faces	<1	1-2	2-3	3-4	6-8
			100%							
Podocarp/Broadleaf Mix (Overburden Fill Areas)										
1	Kunzea robusta	kānuka	15%	1	1	2-3	4-5	6-7	7	7
2	Leptospermum scoparium	mānuka	15%	1	1	2-3	3-4	4-5	6	6
3	Coprosma robusta	karamū	10%	1	1	1-2	4	4	4	4
4	Hoheria populnea	houhere	10%	1	1	2-3	4-5	6	6	6
5	Myrsine australis	māpou	10%	1	1	1-2	3-4	5	5	5
6	Pittosporum tenuifolium	kōhūhū	10%	1	1	2-3	4-5	6	6	6
7	Pittosporum eugeniodes	tarata	10%	1	1	2-3	4-6	8	8	8
8	Knightia excelsa	rewarewa	5%	1	1	1-2	3-5	5-8	10	12
9	Podocarpus totara	tōtara	5%	1	1	1-2	3-4	4-8	10	12
10	Vitex lucens	pūriri	5%	1	1	1-2	4-6	8-10	12	14
11	Alectryon excelsus	tītoki	5%	1	1	1-2	4-6	9-10	12	15
			100%							
N/A = Plant has exceeded its normal life expectancy.										