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Table II-3 shows a full spectrum hierarchy of discard management, expanding on the integrated waste management hierarchy of Reduce, Reuse, Recycle, Compost, Incinerate, and Landfill. This full spectrum adds product and package design, differentiates between closed-loop recycling and other recycling, and includes varying degrees of improper and undesirable discard management, including litter and illegal dumping, which are discouraged, but do occur.

Table II-3: Full Spectrum Hierarchy of Discard Management

Full Spectrum Hierarchy of Discard Management	Examples
Restore to the Natural Step	See The Natural Step web site
Reengineer to deliver services not stuff	Designing for Disassembly
Reducing total impact of process	Closed loop parts washing
Reducing energy or material impact of process	Returnable transport packaging
Reuse in total function and material	Maintenance
Reuse in partial function	Repair & Parts Salvage, 2-sided copying
Reuse in different function	Creative Reuse, Scrapture
Recycling in material, closed loop recycling	Glass recycling
Compost and beneficial soil amendments	Municipal composting with quality control
Recycling in engineered material with degradation	Particle boards, Gridcore
Recycling in material with degradation	Paper recycling
Recycling in material with aggregation	Plastic lumber
Incineration for energy	Burning tires in cement kilns
Use of material for structural fill	Using concrete for road construction
Volume reduction	Shredding, baling, crushing, MSW compost
Use as a soil substitute	Landfill alternative daily cover
Incineration for volume reduction	MSW Incineration
Landfill	Crescent City Landfill, Fresh Kills, NY
Materials create visual blight	Littered paper bags
Materials create short-term physical hazard	Broken glass, plastics in the ocean
Materials create long-term biological hazard	Heavy metals in dumped motor oil, illegal dumping of hazardous wastes

III. Existing Conditions

At the dawn of a new millennium, Del Norte County consists of approximately 32,000 residents in just over 9,100 households, including approximately 3,300 prisoners in Pelican Bay State Prison (though that population fluctuates between 2,280 and 3,500). The area is rural, consisting of the incorporated town of Crescent City and several small unincorporated towns including Smith River, Gasquet, Hiouchi, and Klamath.

In 1994, the last large lumber mill in Del Norte County closed. With the closure of the Rellim Lumber Mill, Del Norte County ended one era and began another. Thirty years before, 43 such mills had operated as the foundation of the local economy. With the establishment of Redwood National and State Parks in the early 1970's and the Smith River National Recreation Area in the late 1980's, over 75% of the County land area is National Park, Forest Service and other government owned land. The role of logging and timber has dramatically declined over the past 30 years, and it continues to drop. Between 1992 and 1997, the number of manufacturing jobs in lumber and wood products has declined by over 38%[9].

With the decline readily available natural resources, Del Norte can facilitate an alternate way to manufacture: using recovered materials. For example, Hambro Forest Products uses wood waste from landscapers instead of mill wastes to manufacture particle board, and Eco-Nutrients uses crab and shrimp shells and fish waste for fertilizer, cat food, and chiton (which is manufactured elsewhere into a variety of products, including dissolving sutures and contact lenses). These companies manufacture with materials which once were regarded as waste. The time is ripe to increase such recovery of the resources in Del Norte's discards as an economic development strategy.

In the next several years, Del Norte's only landfill will close, increasing disposal fees by 50% to 100%. To keep costs to ratepayers low and to comply with the Elements of the Del Norte Countywide Integrated Waste Management Plan (DNCIWMP)[10], the Authority intends to implement programs which supplant reliance on disposal by increasing reuse, recycling, composting, and by expanding local processing and manufacturing capacity for recovered materials. Many aspects of the recommendations of this Zero Waste Plan (ZWP) are required under the DNCIWMP, and all are consistent with and complementary to the Elements of the DNCIWMP. The Del Norte County ZWP will be used as a strategic policy to guide future updates and revisions of the DNCIWMP.

According to the California Integrated Waste Management Board, there are four principle barriers to increasing recycling and other alternatives to disposal in rural areas:

- barriers to raising rates (e.g. potentially increases illegal dumping),
- high collection and processing costs,
- the cost of transport commodities to existing markets, and
- the scarcity of markets in general[11].

This ZWP addresses the needs for businesses and non-profits looking

to create or expand businesses recovering, processing, reselling, manufacturing, and using recovered materials. Regional conditions which demonstrate the need to develop local markets for recyclables include:

1) Local end-users are needed to diversify and stabilize current and future markets;

2) Sufficient volumes of recyclable materials are available for small-scale manufacturing;

3) Increases in recycling have glutted existing markets;

4) Small amounts of materials in other counties in the region could be pooled to have enough material to support a local manufacturer.

For these reasons, long range planning and regional cooperation are needed to support recycling[12].

Recycling market development is thus both an initiative to create jobs as well as a necessary infrastructure for the expansion of salvage, reuse, recycling, and composting operations to incrementally supplant the existing disposal infrastructure. The increased cost of disposal after the landfill closes will also make increased recovery and recycling comparatively more cost effective and/or profitable. However, waiting for the disposal cost increases could delay the expansion of the processing and secondary manufacturing operations by more than five years. Local markets for recyclables could mean better and more stable prices for recovered materials, extended life for the local landfill (and thus short-term lower disposal costs), and decentralized development of the recovery and processing infrastructure before the landfill closes.

This ZWP provides detailed recommendations to implement the principles adopted by the Del Norte Solid Waste Management Authority in 1997: Zero Waste, End Welfare for Wasting, and Jumpstart Jobs with Design and Discards.

Under the California Integrated Waste Management Act, all municipalities in the State must plan to cut their waste in half from 1990 levels by the year 2000. The Del Norte County Zero Waste Plan will provide a model for how a small rural local government agency can apply these principles, plan for total recycling, and create a long-term plan to incrementally reduce reliance on disposal through more efficient use of discarded natural resources.

A. Administrative Structure and Community Partners

The Del Norte Solid Management Authority (Authority), is a joint powers authority of the City of Crescent City and the County of Del Norte, and is responsible for planning and administering all programs related to discarded materials, including waste prevention, reuse, public education, composting, recycling, recycling market development and disposal programs. The table below lists many of the community partners the Authority will work with to implement Zero Waste programs:

Table III-1: Community Partners

Role or Function	Community Partners
Economic Development, Policies, Zoning, and Buy-Recycled	Del Norte County Economic Development Department City of Crescent City Del Norte Community Development Department Humboldt County Recycling Market Development Zone
Public Education	Cadre of Corps (AmeriCorps and the California Conservation Corps) Del Norte Unified School District City of Crescent City Del Norte County Health Department The Triplicate, KPOD, KCRE
Reuse & Recovery	Del Norte Repair, Rental, Consignment & Thrift stores St. Vincent DePaul of Lane County and Humboldt Del Norte Builders' Exchange
Recycling	Julindra Recycling Humboldt Sanitation Redwoods United Curry Transfer & Recycling A-1 Auto Recycling Short's Steel
Composting	Hambro Forest Products Brock Dairy Ranch
Collection	Del Norte Disposal Redwoods United
Salvage / Disposal	Pacific Waste Services Winzler & Kelly Consulting Engineers

IV. Del Norte Discards

A. Del Norte Waste Reduction & Recovery

In 1998, the Authority surveyed and summarized the estimated tonnage from all existing waste prevention, recycling, and composting programs operating in Del Norte County during the previous year. The locations of the processing facilities and/or end-use market for each material was also recorded within the survey. The locations which facilitated reuse and recycling are indicated in Figure IV-1,and are further described in Table IV-1, below. The reader may note that specialized reuse such as used building materials, used musical instruments, and antique restoration are only available from regions to the south or the north of Del Norte.

Waste Reduction, Reuse, and Repair

Table IV-1: Reuse, Rental, & Repair Businesses in the Del Norte Region

Type of Business	Crescent City	Hiouchi	Smith River	Klamath	Brookings	Arcata	Eureka
Reuse							
Antiques	5	1	1		Y	Y	Y
Appliances	1						Y
Automobiles	4				Y	Y	Y
Books	5				Y	Y	Y
Building Materials						Y	Y
Glass	2						Y
Music	2					Y	Y
Children's Toys & Clothing	1				Y	Y	Y
Office Equipment	1				Y	Y	Y
Materials Exchanges	2				Y	Y	Y
Furniture, Clothing, Household items	9				Y	Y	Y
Rental							
Appliances	1				Y	Y	Y
Bicycle	1				Y	Y	Y
Camping & Rec. Equipment					Y	Y	Y
Carpet & Upholstery Cleaning	5				Y	Y	Y
Computer & Electronics	1				Y	Y	Y
Formal Wear	1				Y	Y	Y
Furniture	1				Y	Y	Y
Musical Instruments					Y	Y	Y
Party Supplies	1				Y	Y	Y
Tools & Equipment	2				Y	Y	Y
Video Equipment	3				Y	Y	Y

Table IV-1: Reuse, Rental, & Repair Businesses in the Del Norte Region							
Type of Business	**Crescent City**	**Hiouchi**	**Smith River**	**Klamath**	**Brookings**	**Arcata**	**Eureka**
Repair							
Small Engine Repair	2	1	1		Y	Y	Y
Antique Restoration					Y		Y
Appliances, large	4	1	1		Y	Y	Y
Appliances, small	1				Y	Y	Y
Auto Repair	20			1	Y	Y	Y
Bicycle	2				Y	Y	Y
Bridal Gown Restoration	1				Y	Y	Y
Clocks & Watches	1				Y	Y	Y
Electronics	4				Y	Y	Y
Furnaces	4				Y	Y	Y
Fences	1				Y	Y	Y
General / handyman services	1				Y	Y	Y
Mobile Home repair	4				Y	Y	Y
Blades & Sharpening services	1	1	1		Y	Y	Y
Shoes & leather	1				Y	Y	Y
Tire retreading & repair	4				Y	Y	Y
Tools	2				Y	Y	Y
Upholstery	2				Y	Y	Y

*** This list was derived from the "Del Norte's Guide to Reuse, Repair, Rental and Restoration Services 1st Ed. July 1997.**

Figure IV-1 maps the locations of Del Norte reuse, repair and recycling businesses. The reader may notice that antique stores, thrift stores, and auto repair shops all have a tendency to occupy the same neighborhoods.

On-site Management

The Authority's promotion of on-site management methods which reduce waste have included monthly backyard composting workshops and general public education campaigns promoting reuse, repair, composting, and recycling.

Self-haul Recovery

Recovery in Del Norte is mostly self-haul. The recovery businesses described in Table IV-1 depend primarily on self-haul customers. Recovery of rocks and soils, concrete and asphalt for use at the Crescent City Landfill all depend on having these materials separated prior to delivery, and most are delivered self-haul by the major construction contractors. There are at least two other ways materials are collected for recovery: Private recycling and other Collections of Recyclables.

Private Recycling

Private recycling in Del Norte totaled over 3100 tons in 1997, or approximately two thirds of all recovery in that year. Private recycling includes three main activities:

- Recovery of fish carcasses and crab and shrimp shells from local fish processors, either frozen and processed for pet food, or collected by Eco-Nutrients (2880 tons);
- Separation, compaction and back-hauling of corrugated cardboard from the major grocery and discount stores (230 tons),
- Separation, collection and marketing of other materials which do not have end-users in Del Norte: this included a collection of textiles from a drop-off trailer available to thrift stores in the region and set up by St. Vincent DePaul of Lane, County Oregon.

Collections of Recyclables

Del Norte Disposal, is required under the garbage collection franchise to provide collection of community drop-off recycling bins in six locations throughout the County, as well as streetside community recycling bins for beverage containers. Del Norte Disposal also offers residential curbside collection of recyclable materials, though subscription to this weekly service is less than 1% of the County households. For commercial customers, Del Norte Disposal also offers collection of cardboard or office paper for not more than 75% of the cost of an equivalent size trash bin.

Redwoods United began multi-material collection of recyclables in 1998. These collections are an on-call, charge per pickup basis.

Recovery

Figure IV-2 shows the tonnage by material type for all materials recovered for recycling, composting, or beneficial reuse from Del Norte in 1997. Clearly, the largest tonnages recovered in 1997 are fish waste, rocks and soils. Fish waste was once processed at the landfill into a nutrient-rich cover for rapidly growing vegetation over exposed slopes at the onset of the rainy season. For the past 5 years, these materials (including shrimp shells, crab backs, and fish carcasses) have increasingly been processed by Eco-Nutrients into dried shells and fish emulsion fertilizer. The dried shells are used as a raw material in the manufacture for contact lenses and dissolving sutures, and the fish emulsion is used as a fertilizer by organic farmers. Concrete, asphalt and soils are used for road building and other structural functions at the Crescent City Landfill.

Figure IV-1

Figure IV-2

Processing

In 1997, Coastline Enterprises, then one of the two Buyback centers in the County where residents could get cash back for their recyclables, closed its recycling operations. The remaining Buyback, Julindra Recycling, agreed to receive, process, and market all materials which were accepted by Coastline prior to their closure so Del Norte residents, businesses, and institutions could continue their existing recycling programs.

Challenges to Julindra

In addition to nearly doubling the volume of materials they process each month, Julindra is now also processing all materials collected by Del Norte Disposal through its community drop-off program. In short, Julindra Recycling is currently essential to nearly all recycling of newspaper, cardboard, office paper, magazines, glass, #1 (PET) plastic, #2 (HDPE) plastic, and steel cans in Del Norte County, and they will continue to be essential for the foreseeable future. If Julindra Recycling did not exist, many recycling services in Del Norte would either be discontinued or be considerably more expensive. Since 1998, Julindra Recycling has been the only Buy-back center in Del Norte County, and the only processor and baler of recyclable materials. The authors of this report made the following observations regarding Julindra:

- Julindra did not have time to set up a site-plan for increased material flow.
- Julindra did not have strong markets for some of the materials being collected.
- Market prices are low, transportation costs are high, orders for material are difficult to get.
- A marketing plan could develop strategies to move material.

Before the decision is made to invest in a collection system for an historically low-grade, low-value material (such as non-deposit plastic containers and mixed paper), the Authority should first evaluate if the material now has or ever will have a potential buyer within the region before committing the funds for collection. If not, it may be more effective to instead pursue a much more aggressive waste prevention strategy for that material type. The lower value the material type and the higher the transportation costs, the less likely that collecting a particular material type can be a long-term viable business.

The Authority should advise and assist Zero Waste businesses with contingency plans. For example, plan now for how to handle the cash flow dilemma created when all major transportation lines are closed due to winter mudslides. The Authority should plan with these businesses for their "worst case scenarios." The Authority should explore with these businesses their range of options in diversifying, changing specifications, downgrading/upgrading, stockpiling, or changing markets to ship north or ship south.

Markets

Del Norte County is an isolated region over 350 miles from a major export port (San Francisco or Portland). The materials available to recycle are smaller amounts, compared to amounts coming from other areas. The distance to markets for materials recovered in

producers, retailers, and customers aware of demonstrated negative impacts of their products and packaging, including litter and disposal.

D. Recommendations & Alternatives

Currently about $1.5 million is spent each year on the garbage collection franchise by Del Norte Disposal's customers. Another $1.15 million each year is spent on disposal, closure, monitoring and postclosure costs within Del Norte County. Including the estimated gross revenue of private recyclers within Del Norte County, the total amount currently spent on discard management - nearly $3 million annually - may be viewed as the budget which could be available for moving towards Zero Waste. In the transition to Zero Waste, municipal disposal costs may never go away completely as Del Norte will have to continue to pay the costs for landfill closure, and post-closure maintenance for many years to come. The challenge is figuring out incrementally how to reinvest the available cash flow into programs and practices that will provide price signals to the marketplace to continually move towards Zero Waste.

These tasks will require the Authority to be skilled in planning, contracting for services, providing information and education, economic analysis and acting as a catalyst for changes needed. Unlike a traditional garbage collection system and landfill responsibility with one or two major contracts to manage, the Authority will be working to establish a "reverse distribution system," with many contracts, agreements, and policies to provide services for specific components of the discard streams.

The contracts, agreements, and policies should build upon existing conditions wherever possible. For example, in Del Norte over 88% of the vehicles which came to the landfill in 1997 were self-haulers, and over 60% of the waste disposed by weight was from self-haulers. Therefore, Del Norte recovery programs at the landfill, future transfer station, and other facilities should take advantage of the significant potential for separation and recovery from self-haulers when recovery is as convenient as disposal and the price signals encourage recovery.

The Landfill Operations Contract

The Authority should continue to negotiate improvements to the material recovery at the landfill site, such as establishing a separate per-ton rate for ferrous metals recycling, and placing trailers on-site to foster the recovery of matresses, box springs, appliances and furniture.

The limited remaining landfill capacity in Del Norte County should be viewed as a scarce non-renewable resource. Equipment purchases and operational changes that will extend the life of that landfill should be pursued, to decrease the transitional costs

from current low disposal costs to those anticipated after the County's only landfill closes.

The Transfer Station / Materials Recovery Facility (TS/MRF)

Rate structures at the landfill (and new transfer station / materials recovery facility after landfill closure) should be designed to provide incentives for keeping materials clean and separated as much as possible to facilitate the highest and best use of the materials and products. The Authority should pay the new contractor for the TS/MRF on the basis of number of tons processed through the station, not the quantity landfilled. All tons reused, recycled and composted at less than the long haul and distant landfill disposal fee should be an economic incentive for the TS/MRF operator to help achieve Zero Waste.

The avoided costs of garbage collection and disposal will become a larger concern to many businesses and self-haulers once the landfill closes and disposal costs increase. When individuals source separate their recoverable materials, they should realize these avoided cost savings. This is particularly true for larger businesses and institutions, especially if the person specifying the level of service, coordinates with the person paying for that service.

The Collections and Disposal Franchise

If you want reduction, pay the contractor to reduce. If you want recovery, pay for recovery. We have waste because we have paid for disposal. Local government can greatly influence the potential to retain or enhance the value of discards by structuring the basis of payment to its franchise or permit collection contractors. The Authority should develop additional policies and incentives to ensure that the franchised hauler and other contractors have continuing economic incentives to expand recovery. The franchised hauler should be paid in a way that they make more money on doing the right thing (collecting recyclables), than on continuing the past practices of most material collected going to be buried in the landfill. Similarly, if haulers do not collect materials prepared according to specifications, it should cost them significantly more than doing the right thing.

Negotiate with existing garbage collection franchisee to provide collection services recommended in this Zero Waste Plan, on same payment basis as currently paid, with minor adjustments in rates to cover the amortized cost of capital improvements required by the contractor to implement the Zero Waste Plan recommendations. Whenever there is a choice of designing a system for recycling efficiency or garbage collection efficiency (e.g. on routing of trucks), choose maximizing recycling efficiencies. Also provide incentive in franchise fee structure for non-exclusive commercial waste haulers to provide reuse, recycling and composting services.

For the next garbage collection agreement, design a new system to pay the contractor more for recycling success than garbage collection success (e.g. consider basing the contractor's payments on the total tons documented reused, recycled or composted, not the number of customers served or the number of cubic yards of commercial collection service provided).

- **Pay As You Throw (PAYT)**

One of the most important tools the Authority has within the Collections Franchise is the ability to set rates. The costs for the garbage company to pick up the second can of trash at a single location are less than the costs to pick up the first can. In Del Norte like many places, the disposal cost for the volume of the second can is cheaper than the first. The current variable rate structure for residents provides little incentive to reduce waste and recycle more, due to the small increments for each larger number of cans of collection service:

If the cost per volume for each can was made to be the same, this would be called a Pay As You Throw (PAYT) system, because there would be an equal per volume charge for larger amounts of unseparated waste. The effectiveness of PAYT systems as waste prevention tools however, depends on access to free or low cost convenient recovery options, and is further improved by mandatory separation. When recovery is widely available, PAYT systems provide a direct incentive to reduce the purchase of items and packaging that are not reusable or recyclable. Poor choices result in increased disposal fees. Fee based systems have had dramatic impacts on waste prevention. In Dover, New Hampshire, residential waste reduction increased from 3% to 52% after implementing per-bag trash fees and comprehensive curbside recycling. Annual per household costs for solid waste management dropped from $122 to $73.

Table VI - 2: Communities with PAYT Trash Fees

Community & System	Population	Program Began	Price Paid per month in 1997	Residential Waste Reduction %
Bellevue, WA cans	103,700	1977	$7.13 / 19-gal $12.91 / 30 gal can $18.10 / 2 x 30 gal $4.97 / yard debris $3.17 / recycling	60%
Chatham, NJ blue bag	8,300	1992	$75 / annual fee plus $0.65 / 15 gal $1.25 / 30 gal	65%
Seattle, WA cans	534,700	1981	$10.05 / 12 gal $12.35 / 19 gal $16.19 / 32 gal $16.10 / additional can	44%
Fitchburg, WI can & tag	17,300	1994	$82 / annual fee for 32 gal plus $1.50 per tag, and $34.86 for 64 gal $60.96 for 95 gal	50%

Table VI - 3 : How PAYT Could Affect Rates in Del Norte

Cans Collected / Week	Monthly Cost per household as of 01 Dec 99	Under a PAYT system (equal cost / volume)
One	$12.04	$12.04
Two	$16.94	$24.08
Three	$22.85	$36.12
Four	$28.75	$48.16

Other Contracts and Agreements

Develop memoranda of understanding (MOUs) on a voluntary basis with major institutions which are required to plan for landfill diversion and recovery (e.g. Pelican Bay Prison, Redwood National & State parks, school districts, and government agencies) but could benefit financially in the future if they implement reuse, recycling

and composting programs. Recommend that they put stipulations in the contracts of their suppliers and vendors that coordinates their programs with those provided in the surrounding communities.

Ordinances and Policies

The authors recommended that the Authority draft and pass an Ordinance that changes the prosecution of illegal dumping as a civil offense, finding that two or more pieces of mail in illegally dumped litter is adequate evidence to impose civil penalties for illegal dumping. The Ordinance should provide the Civil Court authority to charge a fine as well as a reward. Litter fine revenues would be dedicated to the costs for enforcement staff and operating costs (e.g. Police, Health Department and Legal support) as well as cleanup costs. Rewards will enlist the full community in enforcing this system, especially involving Neighborhood Watch associations. The presumption of evidence for illegal dumping could be established as finding two addresses or otherwise incriminating evidence in one location to be sufficient.

Financing Incentives

Financing incentives are particularly important to create a viable recovery infrastructure. Currently, landfills cannot realistically be developed without mechanisms to finance the preliminary studies, planning, permitting, start-up and post-closure maintenance costs. Similarly, financing capital expenses of recovery facilities may be triply difficult: 1) in addition to the planning, permitting and start-up expenses, recovery technologies are often expensive, 2) recovery facilities are often unrealistically expected to pay back loans and be profitable despite dramatic fluctuations in commodity prices, and 3) recovery businesses are rarely treated as essential public utilities in the way disposal facilities are. In other words, landfills are never expected to pay for themselves and are often developed, monitored and maintained using public funds and investments, whereas recovery businesses are often placed in competition with disposal without access to similar public resources.

The rationale for financing incentives must answer three questions: 1) What is the source of funds?, 2) What are the desired benefits and outcomes, and 3) Who administers and monitors the funds?

Potential sources of funds include (in order of preference) disposal fee surcharges, fines for illegal dumping, grant and loan programs, deposits or advance disposal fees, permit fees, user fees, and sales taxes. Bonds or locally-administered loan programs may be used to increase the resources available in the short term, but would ultimately be paid through one of the methods mentioned in the last sentence. The benefits of any funds made available to finance aspects of developing infrastructure for reused and recovered materials should be to reduce waste, to reduce waste-related expenses, and/or to create jobs while expanding waste reduction and recovery. The administration and monitoring of such incentives will be determined by the nature and source of the incentives.

As part of the application process for expanding the Humboldt Recycling Market Development Zone to include Del Norte County, the Authority will evaluate potential financial incentives available to recovery businesses. Matching the incentives to the projects will be part of process of developing the facilities and recovery businesses. Potential incentives include local tax deferment or relief, loans, or business cluster development for repair, reuse, recycling, or composting businesses. There may also be opportunities for coordinating and/or expanding financial assistance to reuse and recovery businesses with programs existing in Humboldt County. The Authority will continue to apply for State and Federal grant funds to leverage these local incentives.

For the development of the Resource Recovery Park or other major public and private facilities, the Authority will consider the use of CA Pollution Control Financing Authority low-interest financing options, or issue low interest tax advantaged bonds to help construct solid waste facilities with private partners. If a site requires major renovation and new capital equipment, packaging these debt needs and taking advantage of the lower interest rates of bonds could be considered for several of these projects at the same time. The Authority need not necessarily be the only agency involved. For example, monitoring local banks' track record of Community Reinvestment Act investments can provide leverage to provide more local loans, or joining with the issuance of bonds by other governmental entities within in the region or through the Regional Council of Rural Counties.

As part of the process of applying to expand the Humboldt Recycling Market Development Zone and developing the Resource Recovery Park, the Authority will work with regional economic development agencies and the small business development center to identify funding to provide business planning, product and market development grants to existing or start-up businesses that commit to providing a market for materials recovered within the County, with preference to those locating in the Resource Recovery Park. Providing entrepreneurs the money themselves to do business planning and development is much more effective, if well structured with timelines and deliverables, rather than having consultants or government agencies supposedly do the work for them.

New Investment Instruments

There are two new mechanisms to encourage investment in productivity and efficiency improvements that impact the government and private sector, including households, respectively. They are 'productivity banks' and 'efficiency utilities'. A 'productivity bank' provides low interest loans to government departments and agencies in order to improve productivity in operations. Increased revenues and reduced costs are indicators of increased productivity. Loans are repaid to the 'productivity bank' from increased revenues resulting from the investment and/or budgetary savings resulting from the investment.

Philadelphia started a productivity bank six years ago and has excellent results with its loans to departments for advanced computer technology, specialty consultants and other programs. The Philadelphia 'productivity bank' was capitalized with a $20

million bond issue. Los Angeles County operates a productivity program, although it is not as formal as a 'bank'. Los Angeles County's program uses its general budget to capitalize its productivity investments.

An 'efficiency utility' serves the same purpose as the 'productivity bank' only it focuses on the private sector, businesses and households. Low interest loans are made in order to stimulate immediate investments which allow entities to increase efficiency. Often such investments have a pay back period that is longer than that expected from traditional investments.

Other potential sources of capital for a 'productivity bank' are Community Development Block Grant (CDBG) funds. Another possibility is the use of private sector capital through the Community Reinvestment Act (CRA) provisions of the federal banking law. The CRA was passed to make sure that banks make investments in the communities they serve even though these investments may not meet traditional investment standards. The CRA main focus was the elimination of the so-called practice of 'red lining' in which banks drew red lines around communities in which they refused to make household or business loans. If banks do not live up to their CRA requirements, the federal government can revoke their corporate charters. Communities participate in the process via meetings with local banking officials and letting their needs be known to the bank. The federal government reviews banks CRA performance records on an annual basis.

As part of the research and preparation for the Zero Waste Summit in Del Norte County, six local bank officials were contacted. Each had a CRA program and stated their interest in discussing how CRA dollars can be made available to businesses and individuals.

Policies for Materials without Markets

All materials identified through the Voids Analysis as a 'Service Void' have no functional market for recovery in Del Norte. One interpretation of Zero Waste is that all materials which are landfilled, incinerated, or illegally disposed are testimonies to failure: failure to create market incentives that recognize the intrinsic value of the materials being disposed, failure to stimulate or create a viable local recovery infrastructure, failure to share the lifecycle responsibility for the disposed material with the producer, and/or failure to educate the community about the convenient ways to reduce, reuse, recycle, or compost the material.

Since household and local budgets pay for virtually all solid waste management costs in the country, there is a growing displeasure with the lack of responsibility on the part of manufacturers and distributors of products and packaging. In Europe, extended producer responsibility (EPR) programs have been introduced. Both the US Conference of Mayors and the US League of Cities have issued resolutions calling for more EPR.

Table VI - 4

Eight Steps to Develop Markets for Problem Materials:

1. **Target Producer Partnerships.** If local programs cannot be designed cost effectively to reuse, recycle or compost a problem material, the Authority will work with businesses which sell and manufacture these materials to either: a) completely address the concerns which are problematic about these wastes, or b) take them back from their customers. The Authority will invite producers (through trade associations, manufacturers and/or retailers) a public meeting to discuss the problems caused by these materials, and request their assistance in developing a system which will address these concerns, including the arrangement for "milk runs" to collect and process these materials from similar businesses.
2. **Help Initiate Innovation**. Identify voluntary initiatives that producers might undertake perhaps on a regional basis. Identify incentives which would enable existing or new businesses to provide the desired services;(including possibly negotiating with suppliers for packaging take-back programs for transport packaging);
3. **Expand and Diversify Existing Recovery Systems**
4. **If Partnerships Fail, Extend Producer Responsibility (EPR)**. If public-private partnerships fail to create a recovery system within five years, a Recovery Ordinance, to be developed through a public process, will establish a deposit, fee, fine, or mandatory program for the proper recovery and/or disposal of targeted materials that is levied at the point of purchase as is currently done statewide for beverage containers, used oil and tires. Such programs would only be implemented on products which cannot be reduced or recovered and for which the producers response fails to adequately address their shared responsibility for reducing the concerns associated with sales of their products.
5. **Start Recovery.** The Recovery Ordnance would also require those who sell materials or products subject to the Recovery Ordinance to cover the capital costs for local recovery infrastructure expansion associated with these materials, or to establish a take-back system for those products and/or materials on their property or within the same shopping area;
6. **Assure that recovery is cheaper than wasting.** Review rate ordinances to provide incentives for waste reduction at all levels of service.
7. **Assure that recovery mechanism has capacity to process all recoverable discards**.
8. **Ban recoverable discards from disposal.** For materials which pose extraordinary hazards or which are readily separated for recovery, and for which the recovery system will have adequate capacity, disposal bans are one of the most effective ways to assure achievement of zero waste.

Bans and Boycotts

Bans and boycotts have three distinct roles in Zero Waste policies: to communicate more effectively regarding products and materials, to reject products or materials which are harmful, or to commit market forces to recovery.

Boycotts are coordinated temporary individual actions to reduce or eliminate use or availability of a product or material in a particular situation, to stimulate action by retailers or producer. Boycotts supported by local elected bodies can be particularly effective. For example, an organized boycott targeting a McDonald's Restaurant in New Haven eventually led to the discontinuance of using polystyrene packaging by that fast food chain. Currently, the GrassRoots Recycling Network is coordinating actions to encourage Coke an other soft drink bottlers to use recycled plastic bottles, and the Authority has passed a resolution encouraging the same (see Appendix D).

Bans, which are permanent exclusions of products or materials from specific locations, have two potential functions. The first is an exclusion for worker safety, handling considerations, or environmental concerns - such as the ban on liquid or hazardous materials, or untreated or improperly contained medical waste from landfill. The ban on lead in paint and gasoline has been attributed with greatly reducing the amount of lead in the atmosphere. The US ban on DDT reduced the impact of this poison in our country as well. Many such bans are already in place. Experience with the polystyrene ban in West Hollywood indicates that knowledge and public advocacy of acceptable alternatives are a prerequisite to such product bans.

The third potential function of a ban has been called 'landfill prohibition,' or 'mandatory recycling.' For example, after establishing a yard debris composting facility which is publicly available and reliable, banning such materials from landfill disposal reduces reliance on disposal while directing recoverable materials to appropriate facilities, keeping both material and the related jobs in the local economy. Mandatory recycling often also includes 'mandatory source separation:' bans from including these materials in the disposal collection system, just as liquid and hazardous materials are currently banned. Such bans are particularly helpful when the recovery facility relies on user fees to cover their processing, transport and marketing expenses.

During the transition to a Zero Waste economy, it may cost more initially for everyone to figure out how best to respond to such policies and payments, but any incremental costs should be able to be avoided once they avail themselves of new reuse, recycling and composting services in the Zero Waste economy of the future. In evaluating long-term economic costs and benefits of waste diversion programs, landfills should be valued at the marginal costs of developing and using a new landfill site, including transfer and transportation costs, long-term liability and environmental impairment costs.

As a result, every five years until Zero Waste is close to being achieved, the Authority should provide a progress report and 10 year projection of program activities and waste reduction targets to the community, and convene a regional Summit to identify new opportunities for collective action to achieve Zero Waste goals.

VII. Waste Prevention, On-Site Management & Advocacy

A. What is Waste Prevention?

Waste prevention, also referred to as waste elimination and source reduction, means not producing waste in the first place. This differs from waste reduction, which also includes reductions in disposal through reuse, recycling and composting, which means the processing of discards for use in industry and agriculture. From a municipal perspective, the tell-tale mark of a waste prevention activity is a material management mechanism which reduces disposal and illegal dumping and which requires no collection system. Investments in waste prevention are generally very cost-effective in the long-run because they permanently reduce or eliminate the need for collection and processing. Waste prevention behaviors must be learned and reinforced, which means that an aggressive public outreach and training program is essential to the success of any waste prevention program. When combined with rates which provide an ongoing incentive for each customer to reduce their disposal, waste prevention training can be a cost effective way to reduce both customer and municipal collection and disposal expenses.

On-Site Waste Prevention and Materials Management Training

The evolution of managing solid wastes is similar to the evolution of hazardous waste management. As awareness increased regarding the risks of hazardous materials, regulation also increased. Soon it became clear that the larger the toxicity and quantity of hazardous wastes, the greater the cause for concern. The most effective way to alleviate this concern was to first look for ways to reduce the quantity and/or toxicity of materials used, then to look at how those materials are stored and managed as discards. By preparing written materials and training groups of similar businesses which regularly use hazardous materials, government agencies began promoting management practices which reduce the number of processes which result in hazardous waste. These actions reduced the amount of hazardous wastes generated, and reduced the costs to businesses for hazardous waste disposal as well as monitoring and reporting.

Discarding is a behavior, as are purchasing, storing and using materials. To effectively influence these behaviors most effectively, the Authority must:

1. Understand each process well enough to advocate (or preferably demonstrate) specific improvements to materials management including waste prevention, materials separation and storage, and methods to increase recovery.

2. Communicate the benefits and convenience of the desired behavior(s) to the target audience, and compare the new behaviors to current practices.
3. Communicate the costs, illegality or detrimental impacts of not adopting the behaviors.
4. Work to assure that the benefits of waste reduction accrue to or at least are understood by the design, operations, and/or maintenance staff.

Because of the emphasis on behavioral change, waste prevention training targets specific classes of generators, such as single-family households, apartments and mobile home parks, businesses and institutions. Commercial and institutional waste prevention education generally target sectors of similar businesses. For example, dentists, veterinarians and doctor's offices each use and discard similar materials (paper, medicines and medical supplies, biological wastes, x-ray process wastes, etc.) and could each benefit from a single training, possibly coordinating a group collection of photographic and/or medical wastes.

Public waste prevention outreach should be developed in consideration with how and when discard behaviors are learned. For example, about the time children learn to clean their room (ages 5-8), they also learn about recycling and garbage - this is also the best time to encourage and establish the habits of reuse and backyard composting. Similarly, oil recycling education is best targeted to ages 15-17, as this is the period when people learn how to maintain their vehicles.

The Authority's partnerships with the College of the Redwoods, CalWorks, and other community worker training programs can set up a referral and training systems for new employees. The Authority could also facilitate a temporary employee referral system at the Resource Recovery Park (see Section XII.B) to pool the needs of the different businesses in the Resource Recovery Park and ensure that companies in the Park will have a good quality, well trained workforce.

On-site Residential Waste Reduction

The following are some of the techniques for on-site residential waste prevention and waste reduction:

- Perhaps the most fundamental incentive to promote on-site waste reduction is a variable can rate or pay–as-you-throw system (see section VI.D), coupled with convenient, low-cost recovery options.
- Composting and/or vermicomposting of food discards, grass clippings, and yard debris is an ideal waste prevention activity that produces mulch, compost or soil amendments for on-site use. "Grasscycling", or 'mulch mowing' programs are also waste prevention programs targeting grass clippings. In Del Norte, the Authority and AmeriCorps currently sponsor free monthly workshops to promote composting and grasscycling, and sell composting bins at cost.
- Precycling refers to choosing to reduce waste as we shop: Choosing products with the lowest lifecycle impacts for the product and its packaging, choosing reusable, rechargeable, repairable and refillable, bringing your own containers

and shopping bags, and buying in bulk. This entails the use of available information and education materials about products, and in some cases, scrutiny of labels, to reduce unnecessary materials from entering the household.

- Reuse can include using materials in their original function. Original function reuse includes 'hand me downs' of clothing, appliances, furniture, automobiles, and most recently computers. Mechanisms include garage sales, want ads, thrift & consignment stores, and salvage facilities at disposal sites.
- Old items may also be used in a new function. New function reuse activities include the use of old tires for play swings, the use of scrap paper to make note pads, use of plastic containers to store left over foods, the use of old lumber to make sand boxes. Several depots for creative reuse have been established throughout California area and function as school art supply houses.
- Swap programs can also involve excess food. Planning for social events can include contingency arrangements to deliver left over food to shelters and food banks that serve homeless families and individuals.
- Advanced disposal fees (ADF's) have been used to alert customers to the true cost of a product from cradle to grave. These fees internalize the cost of a product into the purchase price, thereby giving the customer a truer cost of their purchase. These fees have been applied to beverage containers, tires, used oil and batteries and the proceeds pay for recycling and safe disposal programs.

Business and Institutional Waste Prevention

Commercial and Institutional wastes comprised about 62% of the tonnage disposed in Del Norte in 1997. Also, wastes from these generators tend to be process wastes, incidental to performance of a specific activity. Process wastes tend to be less commingled, and can often be reduced or more effectively separated for recovery by following the suggestions from a waste audit. For these reasons, the speed with which a community moves towards Zero Waste is closely tied to the public policies regarding the private sector waste stream.

Many businesses have invested in waste prevention, but government actions often have been responsible for prompting businesses to discover waste reduction opportunities. In a large city like Los Angeles, the educational materials and hands on workshops conducted for numerous industries (including construction and demolition, hospitality) by the Office of Integrated Solid Waste Management may have saved the private sector as much as $300 million. Public involvement in waste prevention in the private sector is logical and legitimate. In Del Norte County, there is an important precedent for public discussion and planning with the private sector. EcoNutrients, a subsidiary of Hambro Forest Products, Inc. evolved from discussions among county, city and private officials. The Hambro company itself employs over 100 workers and is a model 'zero waste' enterprise which uses waste wood chips to make a densified wall board product. The EcoNutrients company pioneered the use of fish industry wastes to develop a successful line of products from these materials.

Similar meetings, called 'sector huddles' have been used to develop other public-private partnerships for developing local markets for material discards. The Zero Waste

Summit (see section VIII.A) included sector huddles for Construction and Demolition materials, Traditional Recyclables, Organics, Metals, and Reuse and Salvage.

Examples of on site commercial and business waste prevention include:

- Innovative activities at restaurants and cafeterias include the use of napkin condiment dispensers instead of single use packages, education programs to reduce food wastage, on site composting and vermicomposting of food discards, use of reusable mugs instead of disposable cups ('lug a mug') programs which have reduced plastic cups by 30%, and switching to washable dishes and glassware (glass and polycarbonate) from disposables (paper and polystyrene) which reduced waste by 25 tons per year at one college cafeteria. In 1999, Authority staff made presentations on waste reduction opportunities for restaurants at seminars organized by the Health Department regarding food handling practices.
- 'Green Workplace' or 'Maximum Green' office building programs have prevented dramatic amounts of waste within government offices in Ontario, Canada. By implementing the program in 42 buildings serving 22,000 workers, a cumulative savings of $1 million in disposal costs and reduced waste from 75% - 90% by weight. Key to the program is a desk-top mini-can for garbage discards and easily available drop off sites for recyclables. Coordination with the janitorial crew is also critical for success. Green workplace programs also involve the scrutiny of purchasing practices, much like precycling programs assist household decision making. These are also called 'smart buying' programs. Purchasing agents negotiate with suppliers to make sure that corrugated packaging is taken back, as are plastic beverage trays. Product review committees have been formed by companies to focus on these negotiations with suppliers.
- 'Waste exchanges' are an important approach to waste prevention for industrial facilities. These programs are information systems (using web sites, newsletters and fact sheets) that list available commodities and packages and provide contact information for those who can use these items. Numerous states, regional organizations and private groups operate waste exchanges, including CalMax (www.ciwmb.ca.gov/CalMAX) and 'mini-maxes' developed by several California counties.

Waste Audits

To assure that waste audit services are available to interested businesses and institutions, trained individuals must be available to conduct the audits. These audits also provide education, suggestions for source reduction, and designs of the most efficient recycling collection programs targeted to traditional or new market opportunities. Ideally, audits of similar businesses would form the basis for general waste reduction suggestions which could then be shared with similar interested businesses.

- Company wide waste audits have been used by many industrial firms to provide analysis of waste prevention opportunities. Some firms in more metropolitan areas offer their auditing services for free but retain up to 50% of the savings from waste prevention recommendations they make. Waste audits have been particularly successful in reducing the generation of hazardous waste from manufacturing facilities. These are referred to as 'pollution prevention' programs, some of which return dramatic savings to their sponsoring companies. By substituting cleaning solvents made from organic materials as opposed to those made from petrochemical materials companies can avoid costly disposal costs and liabilities.
- For waste audits to be accessible to Del Norte businesses and institutions, the Authority must establish a mechanism to assure that trained individuals are available to perform and promote the audits. Waste Auditors may be trained and certified in much the same way the Authority currently certifies Master Composters - after training by Authority staff, auditors become certified by passing a standard test. An alternative would be to create a waste audit training program through College of the Redwoods. Such trained students could do the follow-up visits after an expert did the waste audit to maintain on-going contact and assistance.
- Other ways the Authority may assure the availability of waste auditors would be to develop a regional position, to pay for waste auditors through the business's avoided garbage costs, regional government wage sharing, grant generation, or a combination of some or all of these.
- A more limited waste audit tool would be to have the existing master composters assist non-residential sites in developing on-site vermicomposting and composting programs. There would be a scheduled follow up and problem solving with these non-residential establishments. While composting is an important element of waste reduction, a full waste audit would also include suggestions for improving waste prevention, reuse, and recycling, and evaluation to determine if disposal service may be reduced.

Promotion of On-Site Management

On-site management is the handling, storage and processing of material discards before collection. Improvements in on-site management can potentially reduce pollution, improve worker and public safety, reduce waste and improve recovery - and no new facility is required. Training in on-site management requires education of property owners, architects, demolition/deconstruction and general contractors and their sub-contractors, government planners, elected officials and environmental regulatory and building officials. A good example of on-site management would be the composting of food discards at groceries and large restaurants in on-site composting containers.

- **Deconstruction**

Deconstruction is defined as the on-site management act of dismantling buildings or structures is such a way as to maximize the reuse of building materials, separate the remaining materials for recycling, and minimize or eliminate the amount of materials to be landfilled. After deconstruction, businesses or property owners need to market the reusables and recyclables recovered from the building, and this can be done through on-site sales, incorporation into new designs, or sales through a used building materials warehouse.

- **Out From the Old and Into the New**

The best utilization of used building materials is to design the new building to incorporate the materials from the old building. To accomplish this the new building owners and architects should inspect the existing building(s) with a deconstruction appraiser or inventory specialist who can point out the architectural components that have the greatest potential of recovery or is economically feasible to recover from the building. The architect can then design the new building to incorporate those materials and specify them in the new construction bid.

The National Park Service has used this concept for quite a few years in their demolition contracts. These contracts require the deconstruction contractor (formerly known as a demolition contractor) to save specific architectural components which the Park Service will use for the restoration of historical buildings within the park. For example, the Presidio of San Francisco demolition contract required the recovery for reuse of roof tiles, gingerbread, banisters and other architectural components from the demolition of parts of Letterman Hospital. These architectural components were then warehoused to be used in future restoration of other buildings in the new Presidio of San Francisco National Park.

- **Advance Sales**

This approach is to arrange or contract with end-markets prior to deconstruction for certain materials, and so no new facility is required. Advance sales can help the deconstruction contractor cover expenses and help them decide if they can make a profit on a marginal building. A marginal building might be a building with no timbers (6"x 6" or 2"x10" or greater types of lumber) or other unique architectural features (e.g. 1960s single family homes built mainly of 2"x 4"s and cheap windows, no mantelpieces or other unique features). The resale value of the building components may not cover the cost of labor to deconstruct and transport the materials to the yard or used building material store. With advance sales, the deconstruction contractor at least knows they can recoup certain costs and deconstruct only those parts of the building that will give them a profit. This approach can also potentially promote salvage of high-value materials while still retaining the potential for using the structure for fire department

training, which is frequently selected as a cost-effective demolition technique. The Waste Prevention Purchasing Policy when adopted should also assist in facilitating the types of contracts suggested in this section.

- **On-Site Sales**

On-site sales are materials sales at the site of deconstruction. The Authority could assist by working with City and County agencies to assure that such activities are permissible on public and private land. The Authority could provide free advertising of sales if given sufficient advance warning to place advertisements in the local newspaper. There are two main types of On-site Sales:

Deconstruction Auction In a deconstruction auction, the building owner or deconstruction contractor inventories the building and marks/tags the various parts of the building with an asking price or bid sheet with a minimum bid price. The asking /minimum bid price is based on the bidder providing their own labor to deconstruct that particular architectural component. (Outdoor plants, furniture, fixtures and other items left in the building can also be part of the deconstruction activity.) For customers that do not want to do their own work, the deconstruction contractor will provide this service for an additional charge based on a posted hourly rate.

On-Site Sales In this case the deconstruction contractor has already deconstructed parts or all of the building and customers purchase materials and transport them directly from the site. This saves the deconstruction contractor from transporting materials to their yard, from banding and otherwise preparing the materials for transport and storage costs at the yard or used building materials restore.

Problems involved in “On-Site Sales” include whether public sales can be conducted at that particular location and liability issues from having the public enter a job site. Deconstruction activities that occur on federal or state land may be precluded from selling due to regulations. The Authority may want to research this potential problem and negotiate arrangements with the appropriate agencies to allow for the sale (and the collection of sales tax) on those properties. Appropriate signage and site preparation can help reduce the risk of customers injuring themselves at the jobsite. For example, materials that will be marketed on-site can be moved a significant distance from the actual site of deconstruction and separated by fencing to prevent injury. Careful attention should be made to keep the jobsite free of obstacles especially nails and other sharp objects.

B. Advocacy

Public Education & Information

The Authority currently employs a wide variety of tools in public education and information, in order of usage:

1. Brochure: Waste Reduction & Recycling in Del Norte County 2000 (1999)
2. Brochure: Del Norte's Guide to Reuse, Repair, Rental and Restoration Services (1997)
3. Web page (1999): http://www.northcoast.com/~recycle
4. Newspaper PSAs and advertisements
5. Radio PSAs and advertisements
6. Other brochures and printed materials
7. Workshops, training seminars, and sector huddles
8. Master Composters, Waste Auditors, and other trained outreach
9. Speakers bureau presentations as requested
10. Giveaway promotional items (primarily for used oil recycling)
11. Television advertisements

Items 1-3 provide a comprehensive descriptions of the waste reduction opportunities available in Del Norte, and items 4-11 usually target specific events, audiences, or activities. In addition, recovery and disposal facilities have educational signage.

While the Authority will certainly revise these educational items as programs are modified and expanded, due to the relatively small size of the community, these will remain the primary tools for community education. As waste reduction has a variety of benefits, the Authority will also look for new educational partnerships. For example, credit counseling services, churches and the media may be partners in promoting ways of waste reduction, living more simply, making do or doing without products. Some stores may be partners in providing "shelf-talkers" and other point-of-purchase education.

Recognition & Promotions

The Authority should expand upon the current Green Ribbon Awards and create Zero Waste Awards to recognize individuals, institutions and businesses which are shining examples for others to follow in working towards Zero Waste. The Authority should also work with local businesses to nominate themselves for the California Waste Reduction Awards Program (WRAP) and the US EPA WasteWise Program. In addition to these Awards programs, recognition of achievements throughout the year should be pursued with the local electronic and print media. Media and local elected officials should be invited regularly to tours of innovative programs, held in conjunction with business meetings of the Authority, the Chamber of Commerce and other local associations and business groups. A Zero Waste Lottery should also be instituted that would provide a cash prize for randomly selected residents, institutions and businesses who can document something new that they have done to achieve Zero Waste.

Advocacy to Producers & Generators

The waste audits, sector huddles, on-site management promotions, and policy for materials without markets discussed in earlier chapters will each target waste generators and producers.

Advocacy to Local Governments within the Region

The Authority is currently coordinating the Rural Cooperative Recycling Infrastructure Development Project with Humboldt County and the 20 other counties of the Environmental Services Joint Powers Authority (ESJPA) of the Regional Council of Rural Counties. This two-year project will enable the advocacy for coordinated regional waste reduction and recovery programs. After this project is completed, the Authority's continuing affiliation with the ESJPA will facilitate future advocacy for programs to be coordinated with other local governments.

Advocacy for Legislation

The Authority's subscriptions to trade journals and memberships with Californians Against Waste, the California Resource Recovery Association, and the National Recycling Coalition provide staff with adequate analysis to enable the Authority to identify specific legislation to support. Once a bill is supported by Board action, staff submit letters of support to each committee hearing that bill. This has proven to be an cost- and time-effective mechanism to provide tangible local government support for bills supporting waste prevention and recovery.

Additional Research

The Authority will work through the Rural Cooperative Recycling Infrastructure Development Project to identify areas for further research. By identifying general areas for research and communicating these to the College of the Redwoods, Humboldt State University and the Collegiate Recycling Council of the California Resource Recovery Association dramatically increases the chances that such research will be completed. Such research activities may also be incorporated into future grant applications. The Authority may further increase the availability of students from Humboldt State University to complete waste and environmental audits by setting aside funds to cover these students' travel expenses.

VIII. Regional Recovery and Market Development

A. Border Coast Regional Recycling Marketing Summit

A one-day, intensive forum was planned for approximately 50 participants from Del Norte, Curry, and Humboldt Counties to meet with the DNSWMA and its team of Zero Waste consultants. Held on Friday, July 31, 1998, the "Border Coast Regional Recyclables Marketing Summit" was conducted with an agenda and format designed for optimum participation: a condensed process of brainstorming - problem-solving - strategic planning - and consensus-building.

Goals and Objectives

The Summit was a critical component of the process for developing the Del Norte Zero Waste Plan. The overall objectives for the Summit were three-fold:

(1) For the DNSWMA to learn from Del Norte community and business leaders their ideas for the practical details, business connections, and local resources needed to make the Zero Waste Plan operational;

(2) To inform Del Norte community and business leaders about Zero Waste and its strategies for addressing the County's solid waste problems; and

(3) To bring together Del Norte County, Curry County, Oregon, and Humboldt County business and community leaders to explore the potential for regional approaches to Zero Waste.

Methodology

Two weeks before the Summit, invitations were mailed to more than 100 business and community leaders from the region . Those who responded, received a faxed confirmation (or phone call) with an agenda and list of Guiding Questions that would provide the focus for the Summit.

Agenda

A total of 65 people participated in the Summit. The agenda and schedule were closely followed to provide opportunities for information exchange in the large group context and more detailed idea generation and problem-solving within the small groups. Each of the five working groups were organized with a technical resource

person and a facilitator (Four of whom had previous training in facilitating small group process) and four of the groups had a trained recorder to assist the facilitator. Each of the group facilitators were prepared in advance with a list of guiding questions and instructions to solicit everyone's ideas and to focus their group's discussion toward articulating all the barriers , resources , and the necessary actions and commitments to successfully implement Zero Waste systems in Del Norte County.

The Summit Meeting closed with an explanation to all participants that beyond a written Action Plan, local follow-up working groups will work with the DNSWMA to implement the projects and business concepts developed during the Summit.

Agenda for the Border Coast Regional Recycling Market Development Summit

8:00AM Sign in; receive information
8:30 Welcome & Presentations from DNSWMA
9:15 Business Presentations: "Lessons Learned"
- Irv Elliott, Eco-Nutrients
- Maggie Gainer, Fire & Light
- Dan Knapp, Urban Ore

10:00 Zero Waste: Neil Seldman, Institute for Local Self-Reliance
10:05 Break and join working groups
10:15 5 Working Groups convene:
- Organics
- Salvage and Reuse Incubator
- Construction & Deconstruction
- Scrap Metals
- Paper, Beverage and Food Containers

11:45 Lunch Break and Plenary Discussion with Zero Waste Specialists
1:00 Return to 5 Working Groups
2:30 Participants Vote on Business/Project Ideas from Each Group
3:00 DNSWMA Explain Next Steps; Adjourn Summit

Resulting Opportunities for Local Businesses, Non-profits, and Residents

- This process of a formal, facilitated discussion between the technical consulting team and the local community and business people was successful. It clarified specific projects, their significance for Zero Waste, problems to overcome, resources available and needed, and local businesses with the entrepreneurial capability to make these projects happen by starting new ventures, or expanding and diversifying their existing businesses.
- The notes from the five working groups were typed and provided to the Authority for their future reference (included in Appendix C).
- Cross pollination of regional economic development and business goals with the goals of Zero Waste was assisted by the Summit. Over time, this will result in a greater understanding of the contributing role of waste prevention, materials recovery, reuse, and recycling in the region's economy.
- A current Contact List database of names, agencies, businesses and their contact information, including fax numbers and e-mail addresses has been developed .
- Individuals and businesses who were not at the Summit which are needed to implement the identified Zero Waste projects were identified to be contacted.

The Summit was an opportunity for introductions and first-time meetings between local entrepreneurs and representatives of community-based nonprofit organizations from across the three-county coastal region. These potential future partnerships and business alliances can play an instrumental role in the success of Zero Waste in Del Norte County. Business cards were exchanged for future contact.

The Summit Meeting served as a "kick-off" for cultivating a long-term social, economic, and even cultural context for the ongoing goals of Zero Waste. For the local people in attendance, the Summit defined the terms and established the identity for a new industry cluster in Del Norte. This has provided the basis for weaving a network of inter-related small business operations.

Finally, representatives of local agencies that can help Zero Waste businesses with start-up or expansion financing and the North Coast Small Business Development Center (SBDC) actively participated in the Summit to understand the needs and potential of these types of businesses.

Follow-up

Immediately following the Summit, the DNSWMA staff and consulting team reviewed the written verbatim notes and summary sheets to make sure that the ideas from each group were not lost, and to discuss how these ideas could be integrated - strategically and financially - into the Zero Waste Plan, in the short-term, medium-term, and long-term.

After this intensive meeting, a great deal of follow-up information-gathering is required to continue to move projects forward. It was agreed at the end of the Summit that Project Working Groups will meet again to accomplish that. The key players were identified and will be contacted by the Authority.

Key players who were unable to attend the Summit Meeting will be sent an executive summary of the Zero Waste Plan to solicit their future participation.
A videotape was also prepared, highlighting the main presentations and innovative reuse, recycling, and composting programs in the area.

Summit Evaluation

- The number of participants at the Summit met expectations. However, because the Summit was scheduled in the middle of the summer and on a work-week day, there were several key people who expressed great interest in participating who were on vacation or could not leave their work.
- The working groups' discussions did not include as much regional thinking and planning as had been hoped for the "Summit" format.
- Evaluation forms were distributed to participants at each of the five working groups. Only seven written evaluations were received at the end of the Summit. Of the seven, participants' average "rating" of the overall quality of the Summit was "very good" from choices of excellent, very good, good, fair, and poor. A

strong qualitative participants' evaluation was that there was very little attrition of numbers for the second half of the day after the Summit lunch.

- For more in-depth discussion leading to the much more specific detail needed for the implementation steps of a strategic plan and the initial discussions leading to critical agreements between future partners, a smaller number of participants (i.e. key stakeholders) is recommended for future meetings.
- Depending on the combination of group participants, each of the five working groups worked at different paces and produced information for the Zero Waste Plan in varying degrees of detail. The groups that included the key players, or identified "stakeholders" of the successful implementation of a Zero Waste business strategy were able to develop a more focused and detailed plan.

The small group focused on "Construction & Deconstruction" was able to produce the most detailed notes for strategic planning and had the benefit of having the key players for implementing this strategy at the table. The "Organics" group very quickly narrowed its discussion of the range of possibilities to Hambro Products/Eco-Nutrients and focused on a strategy for this business to recover food waste and sludge. The “Paper, Beverage and Food Containers” group focused on the recovery, processing, and marketing of beverage containers and paper, discussed the formation of an "Innovators Forum" for the creation of local end-uses for these materials, and the necessity to seek the economy-of-scale benefits in region-wide cooperation with collectors in Humboldt and Curry Counties. The "Scrap Metals" group produced a preliminary plan for systems that will increase the recovery of several metal grades ranging from tin cans to car bodies and white goods. The "Salvage & Reusables Incubator" group discussed the wide range of salvageable goods to target but could not produce the level of detail needed for strategic planning because it lacked the business leader to initiate the incubator.

Integration to OEDP and other Local Community Plans

County and City General Plans (especially Land Use Elements), Overall Economic Development Plans (OEDP) and Zoning Ordinances should be updated to allow for reuse, recycling and composting businesses as a desirable use in urbanized areas and to allow for a reasonable distribution of these facilities throughout the County to ensure the opportunity to recycle is provided conveniently to all residents. The definition of commercial and industrial zones should be broad enough to allow different types of reuse, recycling and composting facilities without a Conditional Use Permit. The following types of facilities should be supported in the General Plan for development and/or expansion in different areas of the County in designated areas (perhaps with a Recycling Overlay to the Land Use Map of the County), without requiring Conditional or Special Use Permits:

- Transfer Station/Materials Recovery Facility
- Household Hazardous Waste Facility
- Salvage and Resale Facilities

- Dropoff and Buyback Recycling Centers
- Neighborhood Recycling or Composting Dropoff Sites
- Construction & Demolition Material Recovery & Resale Facility
- Composting Facilities
- Office Paper Collection and Confidential Paper Recycling Services
- Textiles Recovery
- Auto Dismantling
- Scrap metals Consolidation
- Backyard Composting Demonstration Sites
- Baling or Grinding Facilities
- Recycling-based Processors and Manufacturers
- Thrift Stores
- Repair Shops
- Businesses Which Foster Waste Prevention and Reuse
- Oil Recycling & Consolidation Facility

The co-location of reuse, recycling and composting businesses should be encouraged in a countywide "Resource Recovery Park" (see section XII.B) or equivalent land use arrangement to foster innovation and expansion of these businesses. Multi-use zoning should be allowed for such a facility, with retail and manufacturing operations being combined. Existing businesses in the vicinity of the proposed Resource Recovery Park should be assisted as well (e.g. food bank and lumber mill at Standard Veneer).

Incentives could include permit assistance, infrastructure investments, grants, loans, reduced rent/lease for initial period (to allow for ramp up), use of equipment obtained for the Resource Recovery Park tenants (e.g. fork lifts, balers), low-cost disability and workers compensation insurance, access to a low-cost temporary labor pool and access to waste stream under control of the Authority.

In the construction of new buildings in the County, environmental review documents should identify the amount of wastes anticipated from the project, and a Zero Waste plan from the applicants on how they will assure that no new wastes will be added to the landfill.

In the design of all new buildings and the retrofit/rehabilitation of all major existing buildings, adequate space should be provided for reuse, recycling and composting collection containers adequate to handle the entire amount of discards from the proposed facility. All cities within the County should adopt ordinances implementing the model Recycling Facility Siting Ordinance drafted by the CA Integrated Waste Management Board. The County General Plan such include provisions to require adequate space for recycling receptacles in all Single-Family Residential, Commercial, non- Agricultural, Industrial, High Density Residential, and Rural Mobilehome Park zones.

Once adopted, plans submitted for Plan Review to County agencies should be sent to the Authority for their review and comments to ensure compliance with this new rule.

Investigate the Potential for Inter-Industry Linkage with Already-Existing Del Norte Businesses

Clearly, the most effective strategy for economic development within the region has been business retention and expansion. There are a number of methods to weave together the goals of local recycling market development and the region's business retention and expansion goals, including:

a) Conversion: re-tooling , retrofitting, renovating plant machinery & equipment and old facilities to convert from 100% virgin feedstock to use at least a percentage of recycled feedstock
b) Expansion: increase the capacity of Del Norte's small-scale recycling-based manufacturers and artists

The lack of a consistent, available, clean feedstock supply is cited as one of the biggest single problems for all manufacturers who use recycled materials. The role of inter-industry linkages has been recognized as critical to the survival of young businesses. A new recycling-based manufacturing enterprise that is part of an existing industry cluster in the region, has a much greater chance of survival and growth than a company that is operating alone, isolated, with no real connections to other local businesses. "Success breeds success," is one of the foundations of the industry cluster-based economic development approach led by the Department of Trade and Commerce to pull California out of its economic slump of the early 1990's. In an age of flexible manufacturing networks and global marketing, survival for most small and rural businesses depends on their collaborative advantage (i.e., their ability to form regional alliances, symbiotic relationships, small business networks and strategic partnerships with other businesses).

Target "Growing and Emerging" Sectors

Finally, the region's industry clusters that have been identified as "growing and emerging" are the seedbeds for inter-industry linkages with recycling. They are more contemporary, flexible, and open-minded to the possibility of adapting to use recycled feedstock than industry clusters that are "declining." They are generally, more willing to invest in new equipment, employee training, and new systems as they plan for expansion. They are often the region's trendsetters. Del Norte County's growing and emerging industry clusters are:

- prison-related services,
- special-niche agriculture,
- horticulture,
- food processing,
- high-tech/multi-media/software development,
- fine woodworking and other arts and crafts production,
- aquaculture,
- health care,
- environmental technologies, and
- visitor/film industry attraction

These are the types of businesses that should be explored for filling needs for goods, supplies, and services.

Diversification

Local businesses that are growing are constantly looking for new markets and related market niches in which to expand. Some companies may add on a new product line that is made with recycled material, while still maintaining their core business. For example, a local company that manufactures picnic tables made of wood may be a likely candidate for manufacturing picnic tables made of plastic lumber.

B. Integrating Zero Waste into the Regional Economy

If you collect it locally, use it locally

It is very difficult to financially sustain recycling collection operations in a rural region because of the high cost to collect from widely-dispersed populations and the even higher costs to transport these low-value materials long distances to market. Therefore, a critical goal of the marketing strategy and the overall system design must be to develop local end-use markets for the locally-collected materials, as these local markets for recovered materials will ensure the long-term viability of collection systems.

The Authority should play a strong, ongoing facilitative role to local companies that are reuse, salvage, organic material or recycling collectors. While it may be difficult for a small local enterprise to establish all the necessary agreements and arrangements for cooperative collection, processing, marketing, or long haul shipping, the Authority's relationships with neighboring jurisdictions, tribal governments and multi-county agencies such as the Environmental Services Joint Powers Authority (ESJPA) of the Regional Council of Rural Counties can be very helpful to local businesses.

Building upon the concepts in this ZWP, in 1999, the California Integrated Waste Management Board awarded a model contract to the Del Norte Solid Waste Management Authority, in partnership with the Humboldt County Waste Management Authority, the ESJPA , and the Center for Environmental Economic Development in a Rural Cooperative Recycling Infrastructure Development Project to research and develop regional and cooperative programs to expand and improve resource recovery in the Del Norte-Humboldt region, as well as the 20 other northern California counties which are ESJPA members.

In many communities, the unrealistic requirements of special loan and grant programs and the high expectations of enthusiastic supporters have placed the burden of even higher expectations and more difficult conditions on recycling based manufacturing enterprises than for startup enterprises manufacturing with virgin material. While the first priority for all start-up enterprises is sheer survival, the benchmarks often set for recycling-based manufacturers are in terms of feedstock tonnage and number of employees. The Authority should carefully assess the requirements of grant funds and loans that may place restrictions or unrealistic performance requirements on fledgling Zero Waste businesses.

Table VIII-1:Comprehensive 5-Point Model for Recycling Market Development ©

1. Working with Existing Recycling Markets

(a) Negotiate better arrangements with recycling industry brokers and buyers to improve existing marketing arrangements.

(b) Develop regional cooperative marketing arrangements among local governments and/or private recycling collectors.

2. Recycling Industry Attraction

Attracting recycling industries to site a new mill or to local a division of their operations within the region.

3. Local Industry Retention & Expansion Through Inter-Industry Linkages with Recycling

Develop inter-industry linkages between recycling and the region's existing manufacturers, especially growing and emerging industry clusters through several methods:

(a) Conversion: Modify existing industrial processes over time so that local manufacturers can replace their use of virgin resources with recycled materials;

(b) Expansion: Assist manufacturers that currently use recycled materials to expand their production and business volume to increase their capacity to use more recycled materials;

(c) Diversification: Assist manufacturers using virgin resources to expand to add new profit centers, ie. New product lines made with high recycled content;

(d) Manufacturing procurement: component parts and packaging

Seek opportunities for small businesses to supply large local manufacturers; ie. procurement of component parts and packaging made of recycled material.

4. Start Up New Recycling-based Industries

Assist start-up ventures that create local end-uses for recycled materials. Offer assistance to businesses starting to locate in the region to use recycled rather than raw materials in their manufacturing.

5. Procurement Policies, Practices, and Consumer Information

Develop government, business and industry commitment to "make the market" through recycled content product procurement. This includes consumer education to "buy recycled - buy locally made."

©Gainer and Associates, 1990

Grounded in these practical realities for small business development and economic development planning within the North Coast region, a comprehensive strategy rather than a piecemeal or all-eggs-in-one-basket approach to market development will strengthen the long-term economics of recycling in Crescent City and Del Norte County. The "Comprehensive Five-Point Strategy for Local Recycling Market Development" (Gainer & Associates, 1990) is a simple framework for organizing, planning, and efficiently executing a strategy for developing recycling markets. The following is a more detailed explanation of the five main points of this comprehensive model and how it can work for recycling market development in Del Norte County.

Working with Existing Recycling Markets

This first strategy involves two improvements on the conventional marketing approach.

- **Negotiate for better arrangements**

Del Norte Zero Waste businesses will benefit from the "strength in numbers" from joining regional, cooperative ventures. Joining forces with other materials recovery, salvage and recycling operations in the larger region will help to ensure that the Del Norte businesses are able to secure the best prices possible for their materials. The Authority can assist Del Norte County recycling collectors to creatively negotiate stronger, more flexible contracts with their brokers and buyers. Long-term contracts with floor prices, equipment leases or donations, and transportation allowances are all points which may be negotiated with their markets. For example, in 1999 Julindra Recycling installed a baler paid for through a loan from Fiber Reclaim, who now has a long-term contract for Julindra's newspaper and cardboard.

- **Use Backhauls to Reduce Transport Costs**

If something is being imported in, backhauls are what a truck driver can take out on their return trip home. Rural recycling centers have been using this option for a while to ship processed and baled recycled materials to market at the lowest costs possible. For many materials, Julindra uses backhauls to decrease their trucking costs out of the area. The question remains if this approach is being used for all materials to the maximum possible in Del Norte County. An innovative option for backhaul could be backhauling within the region, or setting up a regional backhaul brokerage. What types of products are delivered from warehouse to non-residential or residential sites. How could these backhauls, or back to the warehouse or store be used to collect recyclables? What could make this work? What materials could be collected? The businesses that deliver products would have to be identified and this possibility creatively addressed.

Some product backhaul examples are beer distributors, or more recently, Odwalla that backhaul their HDPE plastic containers. The Vons markets grocery stores have established an elaborate backhaul system for their produce waste from their grocery stores all over southern and central CA. Produce waste is kept in containers in the refrigerators at stores, then shipped back on empty refrigerated trucks to their central distribution warehouse. From the warehouse, all the produce waste is shipped to a central Materials Recovery Facility (MRF) where it is shredded and shipped to another location near farms for composting in the Kern County area above Los Angeles.

Other stores in Del Norte County may be willing to take responsibility for products or packaging which they sell, and takeback such products at their stores to return to their original suppliers for reuse, recycling and/or composting.

- **Plan for Market Slumps and Contingencies**

The Authority should advise and assist recovery businesses with contingency plans. For example, planning for how to handle the cash flow dilemma created when there is an extended period when the scrap prices for large-volume materials do not adequately cover transportation and processing costs. The Authority should plan with these businesses for their "worst case scenarios." Explore with these businesses their range of options in diversifying, changing specifications, downgrading/upgrading, stockpiling, or changing to markets to ship north or ship south.

- **The Rural Cooperative Recycling Infrastructure Development Project**

The "strength in numbers" benefit of cooperative marketing is generally recognized in this region. Sporadically, for periods of time, larger recycling collectors with processing facilities (such as Arcata Community Recycling Center in Arcata and City Garbage of Eureka) have purchased material from the small collectors and served as processing hubs. Historically, several factors, including (1) great distances between each other within the region, (2) a lack of experience in cooperative ownership, management and decision-making, (3) previous negative experiences, and (4) distrust among historically competitive small operators have kept most of the recycling collectors of the Southern Oregon coastal communities and the North Coast of California from realizing these benefits. The strongest deterrent is probably the uncertainty of the marketplace -- dramatic fluctuations in prices -- that keeps the region's recycling collectors from commitment to a cooperative effort, even on a trial basis.

Through a model contract with the California Integrated Waste Management Board, the Authority is attempting to create a model of cooperation. The Rural Cooperative Recycling Infrastructure Development Project is a cooperative project between the two regional solid waste authorities for Humboldt and Del Norte, in association with the non-profit Center for Environmental Economic Development (CEED) and the 19-other counties which form the Environmental Services Joint Powers Authority (ESJPA) of the Regional Council of Rural Counties. The primary goal of this project is to increase the recovery of materials discarded in a two-county region by implementing cooperative strategies to reduce collection, processing, and transport costs and to increase market value, and to apply the lessons learned to the other 20 rural counties of the ESJPA. This project focuses on efforts to cooperatively build the recycling infrastructure, including expanding and increasing the effectiveness of collection, processing, marketing and market development programs, as well as sharing responsibility for information gathering, research and planning, and assessing opportunities to share equipment to jointly market, or to transport recovered materials.

Attract Recycling-based Industries to Site a Plant Locally

The Authority can provide assistance to small start-up recovery businesses by drawing in the resources and expertise of business plan preparation, financial and loan packaging, technical assistance, and business training: all services that will help new ventures to survive the early critical years. Strategic alliances with large firms have been viewed by industrial developers as a key element in the successful start-up and operation of small-scale recycling-based manufacturing ventures. Facilitating these strategic alliances for financing, technical assistance, buyers arrangements, etc. is an important role that the Authority can play.

While industry attraction has not been the most successful economic development strategy for Del Norte County, it is important for the Authority to remain alert to opportunities for recycling-based manufacturers to locate within the region. To be successful, an effort to attract recycling industries must combine the skills and resources of individuals and organizations within the region to carry out the specific elements of a recycling

Table VIII-2
Basic Issues Considered When A Recovery Business Decides Where to Locate

General Business Climate

- Cost of Doing Business
- Availability of Infrastructure
- Availability of Affordable Financing - start-up, venture capital, ongoing access
- A Strong, Local Pro-business Attitude
- Quality of Life Issues - housing, education, recreation, clean environment, natural beauty

Regulatory Issues

- Multiple air quality permits and other permits may be needed depending on the number and types of feedstocks used and the nature of the manufacturing process.
- Uncertainty regarding the process and timing required to obtain permits.
- Legislative restrictions on uses of products made from postconsumer feedstocks.

Access to supplies of recycled materials

- Often, regular and consistent supply channels do not exist for recycled materials and will need to be created.
- Assurances regarding availability and quality of supplies from the point of collection.

Access to dependable customer markets

- Consumers know and understand the quality of products made with virgin materials, and the available supply of virgin materials is perceived as more predictable. Consumer acceptance of recycled materials is in a state of flux.
- There may be variations between access to supplies and consumer demand for recycled product.
- Lack of, or variations in, procurement regulations for governmental or other large consumers limits the ability to produce in quantity or to bid on contracts.
- Variations in consumer attitudes and level of consumer confidence may vary from time to time, from place to place, and from intermediary to end user.

Access to capital

- Financing will be needed for new or additional machinery necessary for using salvaged and/or recycled materials.
- A new industry has no financial track record. Lenders lack familiarity with the process and the potential of recycling-based businesses.
- The job retention/dollar of investment ratio is sometimes not recognized as favorably as job creation by government funding programs.

industrial development plan. This will require commitment to coordinate between Del Norte's recycling specialists and the region's economic development specialists. One key step to enhance the coordinated recruitment of recovery based businesses to the north coast is to expand the Humboldt Recycling Market Development Zone to include Del Norte.

Start Up New Recycling-based Industries

A "marketing strategy" targeting inter-industry linkages and "growing and emerging" sectors of the regional economy needs to be developed for Del Norte County and the entire Southern Oregon - Northern California coastal region to unite in agreement of the kinds of recycling-based manufacturing most needed and the industries to be courted, the economic development agencies to be educated, the types of presentations to most effectively introduce prospects to the community, and the incentives. A coordinated marketing strategy will hopefully be one of the outcomes of the Rural Cooperative Recycling Infrastructure Development Project.

Procurement to Reduce Waste

Local purchasing agents should be provided copies of the California Buy Recycled Training Manual and training that highlights how to Buy Recycled and where to get information on the thousands of products now available that have recycled content - to foster the use of local recycled content products and encourage practices which reduce the generation of wastes in the first place (e.g. reusable toner cartridges). Buy Recycled ordinances should set up a process to identify which cost competitive recycled products are available and then require all those covered by that purchasing system to use those recycled products. This would be particularly important for any reused, recycled or composted products produced locally, so that a stronger demand is created for those products. Any type of public construction or infrastructure project is an opportunity to "make the market." School remodeling projects, parking lots, new wings to public buildings, remodels of public buildings, additions, etc. should all be carefully examined for opportunities to buy reusable, locally-made and recycled products.

IX. Reusable Goods

Reusable goods are discarded items that are useful to a buyer in their present condition, most often for their functional rather than material value. For example, used wrought-iron gates can be sold individually and as-is for hundreds of dollars, but their value is reduced to pennies on the dollar by treating them as scrap. Reuse operators are businesspeople who specialize in attracting, receiving, organizing, and selling discarded reusable goods. Reuse operators upgrade their materials by cleaning, sorting, organizing, and in some cases repairing them.

As a feedstock in the recovery process, reusable goods are characterized by diversity, unpredictability, and wide variations in quality. Well-run reuse businesses must find ways on a daily basis to tame this diversity, compensate for supply swings, and upgrade quality where possible. One way is to create retail departments, places where related and similar materials are taken and where they are further organized. Another is to provide ample tailored storage technologies that contain the organized inventory and present it in a favorable light.

Here is a list of saleable reusable items often found in recycling feedstocks:

- Metals: pipe, conduit, grills, gates, appliances, fasteners, patio furniture, tools.
- Polymers: computer casings, toys, furniture, planter pots, discard collection receptacles, tires, and pipe.
- Wood: doors: fencing, dimensional lumber, furniture, cabinets.
- Glass: dishes, windows, lenses, glass blocks, lamps.
- Ceramics: toilets, sinks, dishes, plant pots, brick, block, stone.

A. Collection of Reusable Items

Although reusable goods are initially not a large category in tonnage terms, they are among the most valuable of all recoverable commodities in the discard stream. This high present value can be used to support a repurchase program that pays suppliers who are able to deliver goods to the operator's specifications. Paying money for goods stimulates more supply than is the case when donation or dropoff is the only alternative, because there are many haulers who will respond only to financial inducements. Experience suggests that as much as 20 per cent of an operator's expenses can be budgeted for purchases for resale.

Among nonprofit reuse operators, collection methods include buy-back, donation, drop-off, collection and salvage. Besides purchasing goods for resale, reuse operators also use donations and collection strategies analogous to recycling's dropoff and curbside modes. A donation certificate stating that goods of a certain value have been given to a charitable organization, is all the compensation many donors request. The donor can often shelter income from taxation in this manner. In dropoff, suppliers simply relinquish ownership of their discarded reusables with no compensation being

paid. In curbside collection, the reuse operator makes house calls and does pickups by appointment.

Salvage businesses take the range of reusable items from the tipping area at a landfill or transfer station, and such enterprises have succeeded under various ownership and management structures. In Monterey, CA, for example, the Last Chance Mercantile sales yard is owned and operated by a government agency. Across the world at the Mugga Lane and West Belconnen landfills in Canberra, Australia, the not-for-profit ReVolve salvages from "the tip" and sells to the public via open-air marketplaces. In Berkeley, California, the for-profit Urban Ore salvages reusables from the tipping area of the refuse transfer station under license with the city. There are many more examples of new reuse enterprises, including at least one, Play It Again Sports, which are publicly traded.

Like most American communities, Del Norte County currently has a considerable, but unknown, volume of unwanted reusable goods that are being stored by residents who believe they "are just too good to throw away." If a full-service reuse operation that provides the same sense of stewardship that residents have already demonstrated can somehow be organized as part of a recycling-based Resource Recovery Park, this untapped resource can be released to commerce. There it can be turned to account and made useful to the citizens. This will generate income for county residents, valuable resources for builders and property managers to use, and tax and other forms of revenue for governments to use.

Pound for pound, a reuse operation that uses all of the proven methods of collection - dropoff, buyback, collection, and active salvaging - will have a stronger positive impact on the local economy than any other form of materials recovery. By its nature, reuse recovery is job, skill, and knowledge-intensive. Nearly all the markets are local. Value is added with a net reduction of pollution. Both release "profits" in the form of improved property value, broadened wealth distribution, diversified trade, and increased employment.

Recommendations

- Encourage reusables that are not able to be donated or sold at flea markets and classified ads to be dropped off at local thrift stores, drop-off centers, container sites, transfer station or the Resource Recovery Park.
- Establish rural reusables exchanges at container sites or transfer station in covered sheds where reusables are sold at garage sale prices (or given away).
- Negotiate with Del Norte Disposal to provide 40 cubic yard bins at the container sites or transfer station for reusables and white goods to be hauled to the Resource Recovery Park on a monthly or periodic basis.

B. Wood Discards on the Northcoast

Deconstruction, salvage and increased recovery of wood in Del Norte has particularly favorable potential. The reason for this is that current recovery effort is minimal, the relative value of the wood in Del Norte buildings is quite high because of the County's history as a logging community, the most frequent management method for building demolition is training burns for the local fire protection districts, and the market demand for such salvaged wood is being proven in metropolitan areas.

A deconstruction contractor without a yard, who does practice advance or on-site sales will be required to sell or donate used building materials to a local or regional used building material resale store. If no resale store is available, then the newly deconstructed materials will either end up being recycled or landfilled.

Selling recovered dimensional lumber outside the Border Coast Region in some cases may be the best choice. For example, selling local redwood to a region that does not have a local source of deconstructed redwood may bring a premium price for the local deconstruction contractor. Until local demand for the materials is developed then selling outside the region may be the only option unless the deconstruction contractor has warehousing space to stockpile materials.

The Authority may want to assist new local deconstruction contractors by maintaining a list of used building materials markets (California, Pacific Northwest, Western, National and International). Several new listserves have been developed to match sources of used building materials, especially lumber, with architects, contractors and furniture manufacturers looking for used building materials.

C. Used Building Materials Resale Store

The closest used building materials resale store at this time is located just north of Eureka. The Authority should concentrate on developing a local used building material resale store to ensure that these materials are available to local residents and businesses. The Authority has several options in terms of developing local used building material resale store. The options are:

- Before issuing demolition permits, County and City agencies may consider the potential for deconstructing parts or all of the building.
- Expand an Existing Lumber Yard to carry used building materials.
- Expand an Existing Reuse Business to carry used building materials.
- Expand an existing Demolition/Deconstruction Contractor to open a used building materials resale store.
- Facilitate a partnership between a used building material business outside the region to partner with a local business or non-profit to open a new used building material resale store.
- Identify and assist a local entrepreneur in opening a used building material store.
- Develop a used building materials resale store that allows for "consignment opportunities" so do-it-yourselfers can attempt to sell materials they salvage from their own remodeling and building projects.

Before pursuing any of the options listed above the Authority should contact the owners of a used building materials store that previously operated in Crescent City and went out of business, called “Bargain Bobs”. Interviews of the former owners of this store would likely facilitate the development of a business plan for the new store.

The Center for Watershed and Community Health and St. Vincent de Paul of Eugene, Oregon participated in the Border Coast Regional Recycling Marketing Summit and may be interested in developing this used building material resale store. Both entities would like to identify a local non-profit that they would work with to develop a store. Both entities have experience in running profitable stores and are ready to begin work almost immediately.

High-Grading Operation

A variation on plans to develop a used building materials resale store would include an enterprise which performs additional value-adding to the materials they recover. A new facility or additional space may be required to set up and operate equipment to be used to take used building materials and high grade them into a more expensive product. For example, studs may not sell for more than the labor to deconstruct and denail them. But if woodworking equipment is used to remanufacture the 2”x4” stud into tongue and groove flooring, the final sale price may more than cover the costs of deconstruction, transportation and manufacturing labor and bring in a profit.

X. Recovery Strategies

Collection efficiency should not be confused with conservation. The collection and processing systems work together preparing materials for an end-user. Materials are not recycled until they are sold to an end-user, who manufactures new goods with them. In Del Norte for example, the scrap value for mixed color glass is generally less than collection, processing and transport costs. So a curbside collection system which fails to separate glass by color - even if it collected more glass than other collection systems - would not be a cost-effective recovery strategy.

For recovery to work, the end-use market must have demand for the material after processing, the proposed collection *and processing* system need to be able to recover materials of an adequate quality, and most importantly, the projected scrap value (even during market slumps) must exceed the full projected costs for collection, processing, and transport. If the resulting per-ton net cost to recycle is less than the full per ton disposal cost (including collection, transfer, transport, disposal, and future liability), then the recycling program for that material, at least from a municipal perspective, is likely cost-effective. Because of the high capital, operations, and maintenance costs of collection and processing systems, investments in education and technical assistance for non-collection, on-site management, and education for waste prevention (as discussed in section VII) are essential tools to assure that the collection and processing systems are not oversized.

A. Collection / Processing / Facilities Overview from the Voids Analysis

Based on the Voids Analysis results from Section V.C., the priority recovery programs and their associated collection and processing systems are as follows:

Table X - 1: Priority Recovery Programs in Del Norte 2000

Target Program	Collection	Processing	Facilities
1. Land Application of Sewage Sludge	Additional transport req'd between sludge processing and land application site.	Lime stabilization or compost	Land application location(s)

Target Program	Collection	Processing	Facilities
2. Establishing dropoff areas for Ferrous Metals, Mattresses, Box Springs, Furniture, and Non-ferrous metals	Drop-off for metals, mattresses and furniture	Separation of furniture and mattresses, separation and mobile baling of metals	Loading ramps and storage trailers for mattresses and furniture. Permitted drop-off location for metals.
3. Select commercial salvage at TS/MRF	No significant change	Either floor sort (e.g. cardboard) or delivery to sorting conveyor.	Transfer Station / materials recovery facility
4. Establishment and promotion of mechanisms to expand recovery of metal appliances and textiles from thrift stores	Identification and separation of reusable metal appliances at landfill, loading and transfer	Processing arranged by end-user	Loading ramps and storage trailers for recovery of reusable metal appliances and textiles.
5. Composting yard debris, food, and paper	This will require a separate collection, and should not target recyclable papers. Storage will have health considerations.	Composting will require permits, monitoring of composting process and stormwater runoff, and screening of finished product.	For such a program, a permitted composting facility needs to be created.
6. Salvage, reuse, and resale facility for construction materials	Drop-off program from deconstruction activities or targeted collections.	Separation and high grading is necessary for any sales.	Used building materials resale facility is required.
7. Collection events or dropoff for electronic equipment	Collection events require temporary locations.	On-site separation, preparation for shipment, or local salvage.	No permanent facility required.

To begin down the path to Zero Waste, the following changes are recommended for the collection system in Del Norte County:

- Work with Julindra Recycling (or other local processor) to develop the capacity to sort commingled recyclables, including all beverage containers, newspaper, cardboard, office paper and glass.
- Negotiate with Del Norte Disposal to expand their curbside recycling service and drop-off recycling centers to collect all commingled recyclables that Julindra can process.
- When disposal costs annually require "cost of living" adjustments in the garbage collection and disposal rates, decrease the rate for curbside recycling so that the cost of collecting one garbage can and curbside service is less than the cost for two garbage cans.

An assessment of the potential market demand for processed organics to a great extent determines the processing and collection system for organic materials. Organics recycling rates should be added to the choices offered to residents and businesses sometime after a pilot project. When the next garbage collection rates are adjusted after the pilot, the program will be most effective if the combined rate for curbside recycling, organics recycling and one can of garbage service is less than two cans of garbage service.

This three sort collection system (garbage, recyclables and organics) will provide residents, institutions and businesses alike with improved convenience for recycling, and will encourage them to choose to reuse and recycle through the structure of garbage rates and collection services.

B. Recovery from Self Haul Customers

Self hauled waste represents an unusually high 88% of the traffic at the County's only disposal facility, and disposes 60% of all tonnage disposed. With disposal costs rising, there will be less incentive for self-haulers to go all the way to the landfill, transfer station or container site. The presence of free drop-off recycling centers and buy-backs can reduce the overall cost of handling waste materials for residents. It can give them an opportunity to dispose of the majority of their recyclables and compostables at little to no costs, allowing them to afford the fee for dumping the materials they cannot recycle.

For self-haul, convenience and incentive is important. The site of recycling and garbage dumping is important. By educating the self haulers to keep recyclables and reusables separate, they could unload those materials first, before paying for unloading garbage.

This could also be done at the container sites in the smaller towns of Del Norte where garbage costs could be assessed after recyclables are removed. This is being done to some extent now. Recycling would be free, but they would charge for garbage. (Examples can be found in Lane County, OR and desert areas of San Diego). Staff could assist in recycling and pull off reusables, or set up a covered

section where these materials could be displayed for free. If sold, the value of the materials could offset the cost of the staff person.

Urban Ore designed a site for Humboldt County where recyclables, reusables and the sale of reusables come together on the site of the transfer station for garbage. Last Chance Mercantile in Monterey County and Recycletown in Sonoma County are other models. Urban Ore has found the most effective way to educate people on what is recyclable or reusable is to verbally explain and show the self-hauler when they come on the site.

At San Francisco's transfer station, self-haul vehicles go to a z-wall platform. Along the wall, there are 20-40 yard containers where materials are separated into cardboard, wood, paper, plastics, foam rubber, glass, metals, and other recyclables. Reusables are pulled out at that time including products (paint, cleaning fluids) that can be reused. Staff assist the unloading of vehicles and sorting into the containers.

Recommendations

- At the landfill or Resource Recovery Park, develop an area where additional materials can be separated and recycled. Create a covered area so self-haulers can sort their materials and lower their garbage costs. Having a sorting system in place for self-haulers to reduce their costs would be important.
- Container sites have z-walls. Recyclable drop offs are also available. Assess what additional materials could be sorted into boxes for recycling.

Overall Issues for Collection

- Consider whether mandatory garbage collection service is needed in the areas provided with such service to decrease illegal dumping.
- Incentives should be established for ratepayers, waste hauler and recyclers so they will benefit economically from greater amounts of diversion.
- The current garbage rate structure does not encourage recycling and should be changed so that there is a linear increase in the cost of additional garbage cans (i.e., one can = $x; two cans = $2x).
- Mandatory source separation may be required if a recycling/reduction goal is not reached voluntarily.

Drop-Offs

- Implement an "adopt a drop-off" program with local businesses and/or community organizations.
- Add a highgrade office paper option (start at one location to see how it goes).
- Examine drop off centers to increase collection efficiency and to identify what could be done to decrease breakage of glass or color separate.
- Promote reusables options.
- Re-start recycling at local schools. Develop and implement the yellow pipeline program, encouraging children to bring recyclables to school on school buses.

- Connect recycling program to supply materials for art and design projects for local schools and individuals (use back haul of delivery trucks in-service now).
- Take advantage of local non-profit community or environmental organizations and skills to help recruit and organize volunteer labor for collecting and education people about recycling and source reduction.
- Use the Chamber of Commerce as a way to educate businesses and get the word out on programs available.
- Modify available equipment to start taking different materials.
- Identify problems in the system and work on them, whether they are policy, product, or people related.
- Examine island or regionally isolated economies. Focus on what Del Norte imports, and what could be provided locally with less or no packaging. Identify what is exported from the County, and how could this be changed to reduce costs or to add value before export.
- Promote the backyard composting program.
- Develop site for organics processing. Start the commercial organics program. Start with a few businesses and work out the design. Purchase equipment needed for a full scale program. Implement the full-scale commercial organics collection program.

Medium Term

- Sort out recyclables and reusables at a site (self-haul) Foster self haul to a central facility, or a Resource Recovery Park where there are spin-off businesses.
- Continue rate changes that encourage source reduction, composting, reusables and recycling.
- Recycling/Material type Disposal Ban.
- Re-evaluate programs, make adjustment, add additional materials if the system is capable of handling them, expand or add programs where possible.

Long Term

- Re-evaluate programs, make adjustment, add additional materials if the system is capable of handling them, expand or add programs where possible.
- Assess if additional materials could be collected.

C. Organics

Currently more than half of the material disposed of at the Del Norte Solid Waste Management Authority landfill is biodegradable or compostable. Paper is the largest quantity of organic material typically discarded for land filling.

Mixed paper when separated into paper stock grades has a value as recyclable fiber for papermaking. The recovery of paper for recycling is discussed above. Only food contaminated paper (food paper) is considered as a potential feedstock for the Organic Management Program. Food paper includes food in wrappers, paper cups, waxed boxes, molded paper and pizza boxes.

The following table lists organic materials currently disposed of daily at the landfill in Crescent City.

Table X - 2: Organic Feed-Stocks Disposed in 1997

Material	Tons Generated	
	Per Day	Annual
Food	6.9	2,485
Wastewater Bio-solids	2.5	911
Food Contaminated Paper	0.9	327
Vegetative debris (yard and Public	0.6	201
Wood (dry)	0.3	109
Estimated Total	11.2	4,033

*Del Norte Discard Generation Study 1997

If aggregated, all these organics could be processed into a mulch. The mulch could be composted by itself or with other organic nutrients into a high quality soil amendment.

Restrictions on backyard burning should be explored as another incentive for composting materials in the future. This would be best pursued once yard waste collection or chipping services were readily available to residents as an alternative.

Storage

Some discarded food can be used by those less fortunate through the establishment of food banks. Good food that is left over, like day old bread and ripe fruits and vegetables, is collected by the food bank and distributed to those in need. All other discards will be separated and stored in three separate containers. The compostable container will be distributed to all residential, commercial, and industrial generators and will collect source separated vegetative debris, wood, food discards, and food paper. The recyclables container will include recyclable materials. The third container will contain the materials that are not accepted in the recycling or organics management program.

Collection

The franchised collector will be asked to provide three material collections for all-residential, commercial, industrial and public container site customers: recyclables, organics and garbage. The collector will price the collections based on the travel and tipping charges for each category at their designated processing locations.

The collector has two front loading compaction vehicles and a roll off truck. One truck could be used for recyclables and one truck for organics or the trucks could be divided in half. A front loading vehicle used for residential collection uses a bucket in front. In some Cities, the bucket is divided, as is the interior of the compaction vehicle. Another possible collection scenario is alternating weeks collection.

Del Norte Disposal's refuse collection route includes over 2900 stops. The five hundred commercial stops can be picked the same way or with dedicated front loading trucks using 1,2 or 3 yard bins. Self-hauled organic material will be taken to the Authority transfer station or the Resource Recovery Park. There will be a large container at the Resource Recovery Park for organics. This container will be transferred to the Organics Processing Center.

It may be more cost effective to take the two separated materials to the Resource Recovery Park and tip them into separate areas or bins and then transfer the organics to another location. This would make the Resource Recovery Park the center of the Del Norte County's Resource Recovery System.

This would also provide the possibility of capturing reusable products for resale from the organics collections (reusable wood) as well as transferring organic residuals (wet paper) from the Resource Recovery Park to the Organic Processing Center.

In summary, the recommendations for collection are as follows:

- **Residential**

- First phase would be on educating and promoting the backyard composting programs.
- Drop off sites for compostables would be made available for those not willing or able to compost in the yard.
- Self Haul will have a drop off area available for organics and food contaminated materials.
- Second phase would be to have all organics collected by the franchised hauler

- **Commerical**

For restaurants and other institutional kitchens, the potential for on-site composting should be explored through a pilot program. If such a program proves too expensive or requires too much maintenance to address health concerns, similar businesses could be targeted for collection of separated organics for municipal composting. The Authority would work with Hambro's to develop their (or an alternate) site for this material. A pilot involving a few businesses would be started. A full scale commercial organics collection program would be implemented once the program design is developed.

- **Long-term**

If on-site composting of organics is not done in the residential or non-residential area (schools), on re-evaluation of the program it is assessed that this makes economic sense, then a collection program could be chosen to handle this material. The options for

collecting are either modifying present trucks to handle two materials, garbage and organics, or organics and commingled recyclables or purchasing a new truck that can handle multiple materials.

Processing

The organics processing center could be at the Del Norte County landfill or at a privately owned site (e.g. Hambro's). If all organics are hauled to the Resource Recovery Park or container sites, the self-haul vehicle traffic to the organic processing center will be minimized.

Processing will involve:

- Inspection and removal of entrained plastics, metals, and other non-compostable material
- Grinding or shredding clean organics into small particles
- Separation of large and small particles using a trommel and screen.
- Transporting dense wood materials to the fuel user
- Spreading compostables into windrows after grinding
- Turning and wetting the windrows
- Screening finished compost for sale
- Monitoring environmental impact
- Testing final products

The grinding equipment should be able to grind 2 tons an hour to handle all the materials in one shift. Trommels and screens are relatively inexpensive. A windrow turner could be attached to a tractor or forklift. The windrows could be moistened with a water truck. A pole barn may be needed to protect the windrows from the rain and prevent blowing paper.

An example of a similar process for a similar sized waste stream can be found in Orlando, Florida. Disney World collects food discards from the entire compound, about 25 tons a day, and stacks the material in a pole barn with a concrete pad with air injection blowers. Ground up pallets are added to create a static pile over an air injector (no need to turn) that accelerates the rate of decomposition. At a certain point in the decomposition, bio-solids from the wastewater plant are added to the pile. The static pile with air injection is a more costly option but may be more appropriate to control odors and resist the impacts of the weather. The Disney World compost is made up of ground up pallets, food waste and bio-solids. Disney sells this compost.

In many areas of the world vegetative debris is mixed with the bio-solids from wastewater plants and made into soil amendment that has a significant nitrogen content. The current bio-solids from the wastewater treatment plant and the septic collection system from outside the city could be incorporated into the compost to add moisture and nitrogen sources.

Alternatively, these materials can be shredded and put into a vermicomposting system. State of the art open bed and enclosed systems are commercially available, where worms are used to produce a high grade potting soil.

Marketing

There are several levels of markets for organic material:

- Lumber and wood recovery for reuse
- Live plants for reuse.
- Mulched leafy green material for roadsides and garden beds and erosion control
- Mulched dense woody material for bio-mass based fuel burners
- Clean Green and food compost
- Clean green and bio-solid mixed compost
- Vermicompost, or worm castings, as a high grade potting soil.

Reusable lumber and furniture could be recovered and sold at the Resource Recovery Park.

Hambro Forest Products will take all burnable material for less than the landfill fee. Mulched material can be used for roadside erosion control, or used as landfill cover. Clean green organic compost has a value for commercial farming and landscaping. Nitrogen enhanced organic compost has more value. There are local agriculture and nursery uses for soil amendment.

The Authority can be a catalyst for enhancement and development of markets for organic materials. The best market for composted organic materials will most likely be for local agricultural and nursery products. The Authority and the local farm bureau could work together and identify the current supply and demand for soil amendment. The Agriculture Commissioner and the Lily Bulb Growers Association should look for grant funds to test the impact of organic soil amendments on growing lily bulbs.

A project could be funded that involves soil scientists and agriculture engineers to test various organic mixtures to provide a positive growing medium for local crops. The University of California Agricultural Extension Program or a similar program could be asked to test and suggest recipes for growing lily bulbs, pine trees and other local products. The local nursery association or garden club could be enlisted to start a master composting program.

● Short-term Priorities

- Initial feasibility study, financial and collection plan to identify costs and critical milestones.
- Establish and obtain permission for demonstration program at Organic Recycling site .
- Establish site for Resource Recovery Park.
- Establish food bank directory and work with restaurants and grocers to provide food to them.
- Select processing system for Organic Demonstration.
- Order processing equipment for Organic Recycling Demonstration.

- Setup collection for commercial organics and drop-off locations for compostables (residential organics, including yard waste, all food waste and food-contaminated paper).
- Establish drop-off locations at the new Resource Recovery Park and Del Norte County Container Sites.
- Grind and trommel organics at Organic Processing Facility.
- Add organics and bio-solids together in pilot program.
- Obtain feasibility reports from Vermicompost system vendors.
- Experiment with local industries about use of or cooperative marketing of compost/mulch products from Organics Processing Center.
- Work with local universities from Humboldt County to southern Oregon to develop testing of organic products and their effects on soils in different applications to provide long-term baseline data needed to improve markets for materials.
- Negotiate with private industry to add composting facility for source separated organic materials at their site.
- Obtain composting permit for landfill (as backup if plans with private industry do not work out).
- Change garbage collection rate structure to provide greater incentive to sort compostables and recyclables (preferably a linear increase in rates/can).
- Consider portable chipper program with local Rental Store to encourage residents to chip their own materials, rather than burn it in their backyards. Consider financing chippers to be rented at low enough rates for residents to use them and decrease their solid waste bill.
- Consider strengthening restrictions on backyard burning in open piles in denser urbanized areas.
- Eliminate free dumping for Government Agencies.
- Work with Hambro Forest Products to be able to process commingled organics from residents, institutions and businesses in Del Norte County, including yard wastes, wood wastes, food wastes, and food contaminated paper. Obtain LEA approval for a pilot, then permit full-scale operations. Design facility primarily to receive commercial vehicles (both Del Norte Disposal and landscapers directly). Accommodate self-haul vehicles to a limited extent. Design Resource Recovery Park to have organics recyclables dropped off for a fee that includes paying for the price of hauling those from the Resource Recovery Park to Hambro's in a commercial vehicle.
- Negotiate with Del Norte Disposal to offer a new organics recycling service to collect all commingled organics that Hambro can process.

Medium-term Priorities

- In order to reduce the loading on the already strained Crescent City Wastewater Treatment Plant, new businesses and expanding businesses should be required to consider composting and organics recycling alternatives as part of their environmental review documents.

- Direct all public drop-off of residential and commercial organics to Resource Recovery Park operations for pre-processing and transfer to Organic Processing Center.
- Structure rates so that economic incentive is there for public to keep materials clean and separated, with impact of higher transfer costs for solid wastes providing added impetus for reuse, recycling and composting.
- Consider residential collection program of compostable “food-paper” (yard waste, all food waste and food contaminated paper collected together).
- Consider need for chip and grind facility at Resource Recovery Park to receive and do preliminary processing of yard and food wastes directly there, to provide "one-stop shop" for general public to unload their reusable, recyclables and compostables. Transfer organic chipped materials to organic processing center.
- Require mandatory separation of compostable and recyclables after reasonable pilot period.
- Attract organics recycling businesses to Resource Recovery Park (including Used Lumberyard, Pallets Rebuilding, Re-milling of Used Lumber).

- **Long Term Priorities**

- Expand markets
- Attract more businesses to Resource Recovery Park.

D. Containers and Papers

In 1999, there is no mandatory garbage collection for residents or businesses in Del Norte. Del Norte Disposal, the franchise waste hauler, has nearly 500 commercial accounts, 30 of which are restaurants that use non-compacted 40 yard boxes and are collected once a week, and a few accounts are collected two times a week. The single largest customer is the Del Norte Unified School District.

Depending on the amount and size of materials, tin-plated steel cans and other ferrous metals would either be recycled at Julindra’s or A-1 Auto Wreckers. It might be preferable for tin cans to be processed by A-1, as they are more likely to be able to leverage the sale of other materials to get the best price for the sale of tin cans. Aggregration of different sources of ferrous materials by A-1 should bring some additional volume to enhance the marketing of their materials

Although the volume of aluminum cans and other non-ferrous metals in this County may be small, the value of these materials warrants greater separation for reuse and recycling. Sorting of different types of non-ferrous metals to segregate materials for their highest and best use sale should be profitable. This is an opportunity for both Julindra and A-1 Auto Recyclers.

Del Norte Disposal Commercial Recycling Program has 35-40 customers that pay 75% of the trash price for a separate bin to recycle cardboard. Redwoods United re-established an office paper collection program ($10 per pickup) in Fall 1999.

Residential Curbside Recycling is provided by Del Norte Disposal to 35-40 customers which pay $3.50 a month for this non-mandatory subscription service. Containers are attached to the residential front loader garbage trucks for collection of the curbside recyclables. Because of the low participation rate in the curbside recycling service, this slight modification of the garbage trucks has been an adequate means of collection. Improved collection systems would involve varying amounts of investment, both capital and labor.

Drop-off & Buy-Back Options

The following are options for Del Norte County regarding collection of recyclables.

- **Drop-off Centers**

People in rural areas tend to gravitate on a regular basis toward a few central places such as shopping centers, schools, churches. As a result, drop-off recycling centers, to which residents bring their recyclables, are a lower cost recycling option for most rural areas. In Del Norte there are drop offs in some of these key locations and at garbage container sites in the smaller towns. Increasing the weights of recyclables at the drop off sites would be cost effective, coupled with examining the site for increased collection efficiency. In Del Norte County drop-offs have multi-material containers. Newspaper fills up long before other materials. Having a separate container for the newspaper would make collections more efficient and would make available the former news section to the next highest volume material.

Recycling drives by non-profit community groups can take place at specific times as a group's service project. When recycling markets are strong, these projects can also be fundraisers for the organization. Because of Del Norte's location to markets and presently low market rates for recyclables, fundraising is not much of an option, without any public support. The Authority could pay service organizations a premium during low market periods, to keep the continuity of these operations as fundraisers and recycling opportunities on a regular basis for the community. There could also be special recycling collections at central locations if is determined that this would bring in additional tonnage, and/or to educate residents about other recycling/ source reduction options.

The Authority should find community, youth, or environmental groups that will adopt recycling drop-off sites and promote those sites to their group and other community groups, distribute available educational information, and answer questions people may have about the recycling programs. These groups could have special recycling and education events to increase tonnage and could help staff tables at community events.

- **Schools**

The school drop-off program was discontinued following the closure of Coastline's

Americorps would establish a one day a week collection at each school. As the Americorps staff move from school to school for the collection program during the week days, an educational component would be done in the classrooms on that day. The children would then train the parents. All children could participate through the "Bag it and Bring it" or what has been called the "yellow pipeline" program no matter whether the student is dropped off or comes in on a yellow school bus. Bags or bins with recycling directions could be distributed early in the program. The sale of the material could be used as a fundraiser. Competitions between schools could be created to increase participation.

Materials recommended for the school program are aluminum cans, glass containers, PET (#1 plastic), ONP, OCC and office paper/mix. It is not recommended at this time to take #2 plastic (HDPE) until a consistant market has been found. Collection

- In order to reduce the loading on the already strained Crescent City Wastewater Treatment Plant, new businesses and expanding businesses should be required to consider composting and organics recycling alternatives as part of their environmental review documents. could be done with Americorps on flat bed trucks with rolling carts of source separated material. Or collection could be done by Del Norte Disposal with a multimaterial container moving from school to school. Alternatively, a mobile recycling truck could be purchased, with the truck moving to different school sites.

- **Community Drop-offs**

- Promote programs through community, environmental, and business groups to increase amount recycled through drop offs. Solicit community groups to adopt drop-off sites.
- Develop signage to educate and inform the public on sorting and markets.
- Strengthen processing of recyclables.
- Establish markets before expanding or continuing collection of materials.
- Examine marketability /cost benefit factors of materials being taken at these sites (e.g., plastics)
- Increase collection and unloading efficiencies of drop off containers. Add a separate newspaper box to sites that have a higher level of newspaper and collect these additional containers with commercial recycling pickups.
- Add an office pack mix to drop-off sites and publicize that service to offices in the area.
- Reduce illegal dumping to decrease operational costs of drop-offs. Follow adopted Authority policy regarding illegal dumping and make ordinance changes suggested in the policy section of this Plan to make enforcement more effective.

- Buy-back Centers

The only buy-back recycling center where customers can redeem their California Redemption Value containers is Julindra Recycling. This center also takes materials such as office paper, newsprint, magazines, and corrugated cardboard, and gives the option to

quickly drop off California Redemption containers if individuals do not want to wait for payment.

Other buybacks in rural areas have found that payment for some of the recyclables will increase tonnage of all the recyclables coming into the buy-back. In addition, providing equipment and space at buyback centers for independent contractors to sort materials collected could encourage more independent entrepreneurs to collect recyclables (e.g., on a part/time basis as a supplementary income). This has worked well at West Coast Recycling in San Francisco (350 Rhode Island Plant). Individuals with high sided pick up trucks collect materials, come to the plant, have a covered area to sort, containers are provided for them to sort into, and the material is weighed and cash paid.

A good example of a site having a section for drop-offs of all materials towards the front of the processing facility, and a buy-back further back is the CCC in Berkeley. Two and three-yard bins are set up just inside the fence where individuals and businesses can drop off all the different materials that are accepted by the CCC. Behind these drop off areas is the buy-back for CA Redemption Value (CRV) materials. Someone can come in and drop off some lower value materials, and then either leave or go through the center more quickly to have their higher value CRV materials weighed for purchase. The containers are small enough to monitor quality with a staff person checking the materials

- Recommendations

- Julindra should have a staff person welcome clients and educate them on how to bring in their materials, other materials they can bring in to drop-off, and how to prepare the materials for the quickest processing.
- Julindra should set up drop off containers at the front of the site and add large signs to clearly identify what is accepted at the site (completed Fall 1999).
- Julindra should clarify the materials flow and traffic flow for the center.
- Julindra should assess whether a short sorting line is needed for quality upgrading and color sorting glass.
- The Authority should contact Berkeley's CCC and Arcata Community Recycling Center for examples of what the city pays for processing fees on material types. The Authority should consider paying Julindra a processing fee on materials that can not be sold at a market price at a rate to cover the processing and shipping of the material.
- The Authority should pay for targeted materials during low market conditions at key locations to motivate people to at least continue, and preferably increase, their recycling of those materials.
- The Authority should consider starting an independent office collection program where an individual would collect paper material from commercial accounts and have a place to sort on-site (e.g., at Julindra). Julindra could then purchase the sorted material (like the West Coast Recycling operation described above). The Authority should consider providing Julindra a base rate for material collected in this way to initiate this service, which could decrease as market conditions become stronger.

- The Authority should assist Julindra (and any others who are interested) in developing a marketing plan for their recyclables.

Residential Collection Programs

Currently, markets for recyclables are very low and transport costs are high. Even with these conditions it is important to start to compare the cost of recycling collections to the present and future cost of disposal.

Considerations for collection programs in Del Norte are:

- Collection systems costs need to be minimized.
- Collection systems need to be simple.
- There need to be economic incentives
- Public education efforts need to targeted to Del Norte County's population.
- Public education needs to highlight economic and community benefits, both short and long term and how strengthening the overall discard management system will have long term economic benefits for sustainability.

Because of the remoteness of Del Norte County, it is important to look at other isolated counties or islands to examine what works for these places. Kauai has done a lot of work around recyclables. Tillamook, Oregon is another example. Information should be gathered to examine these island and isolated locations. Successful programs should be examined for possible applications in Del Norte County.

It is important to the efficient collection of the garbage, recycling, composting and reuse programs to design a destination site that can accommodate all of the materials being collected on the same trucks. For example, all reuse, recycling and composting collection programs should be designed ultimately to flow into the Resource Recovery Park. Other design considerations should be the dovetailing of the residential and non-residential collection so that programs can be combined for collection efficiency and truck use. The amount of mechanization and the amount of processing capability will impact the design, efficiency, and level of commingling of the collection program.

Residential Recycling and Garbage Collection

A front loader is currently used for the 2,400 residential garbage collection customers. It may be possible to modify the truck for two types of material. Then, depending on the program developed, this truck could take multiple materials such as wet/dry, garbage and organics, organics and commingled recycling (would need a sorting line). There is also the option of dedicating the truck one day a week to recycling collection and one day a week for garbage collection (the truck would have to be cleaned between garbage and recycling). Another possibility would be for one truck to be used to collect residential, commercial, and industrial recyclables as one integrated recycling collection route.

Another option would be the use of co-collection vehicles custom designed specifically for the needs and tonnage levels of Del Norte County. Co-collection models include:

Loveland, CO: vehicles were custom-made to have a rear loading area for garbage, and a side loading area for recyclables. The vehicle costs over $120,000. The town of Loveland has established the cost savings of having only one truck on the road to pick up garbage and recycling. They use a bag and tag system.

Guelph, Ontario: 35,000 households in downtown core. Uses side loading, two compartment vehicles. It is a wet/dry program where the dry recyclables go to a Materials Recovery Facility (MRF). This is a more capital intensive processing program.

The design of the truck has to take into consideration how much money, or how cost effective the whole system will be, and whether the product will be marketable after processing. The Authority must take into consideration how the collection program affects the processing equipment and labor demands, and how all of it affects the value of the material ultimately shipped.

- **Containers**

Another design consideration and cost of a program is the containers that could be used to store recyclables waiting for collection and whether the truck choice demands a certain type of container. Some towns have put less of an emphasis on containers in the curbside collection programs, having residents use boxes and paper bags to put their recycling curbside. Some have reused plastic buckets that have come from bakeries and food production businesses. Special plastic bags either clear or a bright color have been used in many communities for recyclables and garbage. In Worcester, MA, the different bags are purchased by the resident or business. Others believe that the container makes the recycling program work with bright colored boxes or specific types of containers such as dual material. If there is a customized truck purchased for either residential and/or non-residential, a specific container may need to be purchased.

Many towns provide these containers. A consideration on the choice of the containers would be the cost and whether the Authority could purchase them and distribute to customers or whether the customer would purchase them.

Residential Curbside Recycling

In low density areas, curbside routes typically have fewer stops than urban routes, and may therefore require less capacity. In Del Norte, curbside collection of recyclables are done on a voluntary subscription service basis. There are fewer than 40 customers at this time. Regular garbage trucks have been modified with containers attached where these recyclables can be collected, avoiding the need for a separate truck for recycling collections.

Customized co-collection garbage and recycling vehicles or trailers attached to garbage trucks are another option if curbside recycling collection becomes mandatory and

tonnage levels increase. These options would make it possible to handle garbage and recycling in one stop. Customized trucks are an expensive option with trucks costing well over $120,000. With customized trucks it is important to have careful bin sizing. Ideally, the design would be flexible to adapt to changing conditions of market specifications and other changes so that one material overflow does not generate the need to return to unload while other material sections are half full. Other considerations are light-weight, good mileage, large capacity and on-board compactors or cages.

Curbside collection would be a higher cost to local residents than drop-off collection, which offers lower convenience. Often small towns make the mistake of investing in curbside recycling because the urban areas are doing curbside collection and think they should instead of comparing all the options to find the best for that town. Low density areas make curbside very inefficient and costly if it is done in separate trucks. If there is only a small amount of recyclables, a processing center may have too little to process cost effectively, and materials should be collected in a form requiring a minimum of processing. Source separation of materials may be less convenient for residents (or businesses) and may result in lower collection weights, but it is a cost effective way to ensure higher quality of recyclables and to minimize the investment needed in processing equipment.

Customized co-collection vehicles or trailers behind garbage trucks are the two options for efficient garbage and recyclable collection making collection more efficient in rural and small town settings. Sorting the containers at the curb is also a way to reduce the need for investing in sorting lines and maintaining a high quality of material.

Del Norte County could examine whether garbage collection has to be weekly. Every other week garbage and recycling collection may be an option, which is being used increasingly in Europe, particularly with food waste composting programs. This would require an ordinance change, but could result in a more cost effective collection operation with increased participation in both recycling and composting.

To begin down the path to Zero Waste, the following changes are recommended for the collection system in Del Norte County:

● Recommendations

- Drop-offs are the first focus for the residential recyclables and the lowest cost.
- Work with Julindra Recycling to develop the capacity to sort commingled recyclables, including all beverage containers, newspaper, cardboard, office paper and glass.
- Negotiate with Del Norte Disposal to expand their curbside recycling service and drop-off recycling centers to collect all commingled recyclables that Julindra can process.
- As disposal costs will require adjustments in the garbage collection rates, decrease the rate for curbside recycling so that the cost to residents of subscribing for the collection of one garbage can and curbside service is less than the cost for two garbage cans.

This three sort collection system (garbage, recyclables and organics) will provide residents, institutions and businesses alike with improved convenience for recycling, and will encourage them to choose to reuse and recycle through the structure of garbage rates.

Non-Residential Collection

It is important to examine local institutions, recreational areas, fairs, local manufacturers, local businesses and other seasonal businesses for a waste assessment to design programs to recover the most marketable recyclables. Targeting institutions, businesses, special events and seasonal waste streams would target over 60% of Del Norte's waste stream. Grouping non-residential institutions would more clearly identify what types of collection programs would most effectively recover these discards.

In Del Norte, institutions include the prison (according to Del Norte Disposal, they recycle everything with only organics remaining), state and national parks (with seasonal demands), schools (seasonal demands), restaurants (seasonal demands), and other businesses. Clear assessments of what could be source reduced, what can be reused, what can be recycled, what can be composted and which are the most cost effective options should be done.

In Del Norte, there is an office paper and cardboard recycling program. Presently the office paper collection has few customers taking advantage of recycling through this program. What would it take to make the other non-recycling institutions join the recycling programs? A survey could be conducted either through the garbage bill or by telephone asking businesses what types of materials they do recycle, what types are available to recycle, whether they know about the different recycling programs, whether they are interested, and what they would need to start an office paper collection program in their organization. For example, according to the discard generation study, only 10 percent of the highgrade white ledger in Del Norte was recovered in 1997.

The Authority could develop a cost-effective office paper and cardboard (OCC) program by having offices collect a mix of office paper in reusable bags which the Authority could make available. Bags filled with office paper could be placed in the OCC container. When that material arrived at the processing center, the bags would be pulled from the OCC. This would reduce the need for two recycling collections at the same office location.

Designing the mixed paper collection program so the product is salable is critical. The tonnage levels available do not warrant the purchase of a sorting line to upgrade the material. Confidentiality of the documents collected for recycling is an issue in Del Norte where law offices and other generators may not have a shredder. These offices feel it may be less of a risk if the material goes to the landfill. This concern would have to be addressed to convince these potential recyclers. Confidential destruction is a natural adjunct to a recycling collection and processing program but would entail another level of training and design of an appropriate collection system.

Other options include:

- Use a stake-bed truck and trade out 90 gallon rolling disposal carts (The Authority owns 100 toters) of office mix and/or white ledger.

- Group a number of the small non-residential sites together so that one container could be used to recycle the paper and OCC for multiple locations.

The Authority is examining the office paper collection to see how all of this could be packaged in a way that would attract an entrepreneur to start a collection program. Charging the non-residential sites and selling the material to the processor (presently there is no payment for this material) would pay for this program.

Education of all employees, establishing an educated, responsible contact person who would maintain the program on the inside of the organization, and changing custodial agreements to include responsibility of recycling are all parts of this program. Having the unrecyclable container being a "mini-can" and the recycling containers be much larger helps to change the psychology of discards within the organization.

Portable Processing and Collection

When large appliances, other metals, tires, and wood brush need to be collected there are other options than just picking up the materials and taking it to a processing center, such as:

- Appliances and other metals could be densified using a portable densifying machine with a flat bed truck to carry away the processed and baled metals. Materials would be ready for market as they are collected.
- Tires: a portable shredder or tire baler could make collection more efficient and product ready for market use.
- Wood brush: a portable chipper could roam the streets chipping brush for mulch or composting use on-site, or be shipped away for co-generation use.

E. Metals

Metals represent one of the immediate challenges for Del Norte County. Due to dramatic recent decreases in the prices for metals sold by scrap processors in the County, metals recyclers require assistance in marketing their materials and improving the efficiency of their processing. Local discarded resources that include metals which could be reused or recycled are:

- Cars
- White Goods (e.g. refrigerators, washing machines)
- Industrial scrap (e.g. steel beams)
- Dismantled Structures (e.g. pipe, fencing, metal sinks and bath tubs)
- Tires (5 pounds of each tire is steel belt)
- Couches and Mattresses (springs and frames)
- Small Appliances
- Freon, which although is not itself a metal, is recoverable and is found in refrigerators, freezers, and air conditioning units

The following is a description of how those metals could be reused and recycled. Most of these materials would be recycled more if there were improvements to the collection, processing, hauling and/or markets for these materials.

Cars

Scrap auto bodies, whole and in pieces, are being stored on private property and littered throughout the County illegally, causing a serious blight on the landscape. With the new Abandoned Vehicle Abatement Authority Abatement Program, this problem is being properly addressed for the first time in many years. Cars are being collected by the Abatement Program, and brought to A1 Wrecking Yard, where they are being compacted for shipment and sale to markets. In 1999, this program facilitated the private towing of 496 vehicles from public property and the public towing of another 20 cars from public lands or roads.

Unfortunately, prices for auto bodies have decreased dramatically this year, decreasing the economic viability of the current system. It appears that the best solution to this marketing and processing problem would be to obtain a high-powered baler to compact the metals received. This could be done in one of two ways:

- A-1 Auto Wreckers negotiate with Cascade Auto Recyclers to have their portable baler periodically bale their auto bodies prior to shipping.
- A-1 Auto Wreckers obtain their own new or used stationary or mobile baler, financed with a low cost loan through one of the financing tools discussed below (e.g. USDA Business and Industry Loan, SBA Environmental Business Loan Program, Recycling Market Development Zone loan together with Humboldt County auto recycler or AFL-CIO Business and Housing Trust)

Alternatively, some improvement in the trucking service, shipping auto bodies out of Del Norte County to markets, might provide a greater profit margin than currently possible. Unfortunately, there are only a few options for trucking these car bodies, and there were no clear back hauls identified that would be able to help with this transportation problem.

Once the processing and marketing of auto bodies is resolved, then the collection of the remaining backlog of auto bodies needs to be addressed, and an on-going system established to minimize the illegal dumping of these in the future.

In many other communities, auto recyclers have worked with non-profit groups to arrange for the donation of nonworking autos by residents to non-profits for a tax deduction. The non-profits establish a relationship with an auto recycler, who processes the cars and sells the parts and materials for reuse and recycling. The non-profit gets a percentage of the revenues from sale of parts and materials, and the resident's tax deduction is usually more than they could get by selling the car directly to the auto recycler.

White Goods

White goods include refrigerators, washing machines, ovens, water tanks, clothes driers, and similar large appliances which do not usually fit into garbage cans for easy disposal and are costly to self-haul to the landfill. To build on the successful cleanup of these items during the 1998 free metals recycling events, an ongoing collection of white goods is needed. Four options are suggested:

- **Drop-box at Container Sites** - A 40 cubic yard roll-off container could be located at the container sites in Gasquet and Klamath, at the landfill and future transfer station, as well as new sites at reservations and the intersection of North Bank Road and Rt. 101. White goods would be deposited in those drop-boxes and collected on a periodic basis as needed (probably monthly). Fees to dump white goods at these locations would be kept as low as possible (if not free), to encourage the flow of these materials to these locations.

- **Reuse Sheds at Container Sites** - Either in addition to the above, or instead of the above approach, construct simple pole barns or metal sheds at the above locations to attractively store white goods (and other reusables such as couches, mattresses and furniture) received. These would be combined with other reusable products discussed elsewhere in this Plan, to be sold (or offered for free) to anyone who wants them. This is based on "Free Tables" set up in some communities to foster the free sharing of one person's excess products, for someone else's use (this is particularly used for household hazardous wastes).

- **Reuse and Repair Businesses Accept White Goods** - Similar to the above systems, the Authority could contract with one or more Reuse and/or Repair businesses to accept white goods (and other reusables such as couches, mattresses and furniture) from the public, for a fee. The fee could be paid directly by the residents, the Authority, or shared by both initially, until the volume of this activity is better known.

- **"Free Dump" Day** - Once the baler improvements at A-1 Auto Wreckers are accomplished, the Authority could encourage A-1 to offer a "free dump" day on a monthly basis for businesses to bring their nonworking scrap metal devices.

The markets for these white goods would be enhanced by the processing improvements recommended for A-1 Auto Wreckers. Nonrepairable white goods could be included in the larger bales that such equipment would make, and sold together with the scrap auto bodies.

Industrial scrap

Throughout Del Norte County there are many piles of metals on industrial properties, which include such things as: equipment parts, metal fencing, metal building parts and steel beams. The backlog of these materials is being addressed now as part of the Abatement Program, but needs a better system on an ongoing basis.

As noted with white goods above, once the baler improvements at A-1 Auto Wreckers are accomplished, it is recommended that the Authority encourage or contract with A-1 to offer a "free dump" day on a monthly basis for businesses to bring their industrial scrap metals.

- **Dismantled Structures**

These products include pipe, fencing, metal sinks and bath tubs and would benefit by a system established above for white goods and industrial scrap.

F. Couches and Mattresses

Del Norte County needs to have an enclosed drop-off system in place for these products when people are moving in/out of their homes and businesses. This service needs to be very accessible and convenient for people who are moving. One or more of the options discussed above under White Goods needs to be implemented to provide a good home for these products.

Reusable couches and mattresses should be encouraged to be reused however possible (see options under White goods above). In addition, couches and mattresses could be dismantled and their component parts used or sold. The latter is being done in Alameda County today. This would be a good opportunity for a project of the Prison Industry Authority.

G. Small Appliances

These are similar to white goods, couches and mattresses. In addition, repair services could be fostered by advertising those that are available, and helping to train the next generation of repair staff. A program could be instituted with one or more local repair shops, or negotiated with the Prison Industry Authority, as a project that they could undertake.

H. Polymers and Mixed materials

Tires

Although tires disposed at the landfill are reused to hold down tarps, disposal costs range from $9 - $27 per tire. Tires are probably the single most visible item that is illegally dumped in Del Norte County. As five pounds of each tire is a steel belt, this is an opportunity to address the metal recycling potential of tires and associated issues. The Authority has secured a tire grant from the CA Integrated Waste Management Board (CIWMB) to provide a free tire amnesty at four locations throughout the County. The authors recommend that in future, any business which sells tires in Del Norte County be required to takeback tires from that customer. A separate future grant from the CIWMB

could be used to assist local tire retailers with the startup costs for needed storage containers, hauling and processing services need to be established to properly implement this takeback ordinance.

Major potential end-uses for tires include: baling tires using Humboldt County's mobile tire baler for soil stabilization, producing crumb rubber for use in molded rubber products or rubberized asphalt.

Plastics

Plastics make up 6% percent of the discards disposed of in Del Norte County. About four tons a day of plastics are discarded each day in Del Norte County. This makes about 1,200 tons per year.

Table X -3: Del Norte Plastics Disposed in 1997		
Type	Annual Tons	Day
HDPE	119	.3
PETE	92	.3
LDPE	399	1.1
Durable	174	.5
Other	445	1.2
Total	1229	3.4

PETE is sold as commingled PETE or #1 plastic at a price set by the Department of Conservation, Division of Recycling. Current prices are about the mid-30-cents-per-pound rate. Most PETE containers in the waste stream are food and beverage containers.

HDPE and LDPE are polyethylene's and can be sold separated and have the highest value in the non color state. Almost half (1.4 tons per day) of the plastic is ethylene. HDPE or High density is primarily found in containers for milk and food products and detergents and motor oils and have thick walls. LDPE or low density is made up of shopping bags and other bags and wrappings.

The other and Durable categories must be graded to have value.

● Policy

Plastics should be included in the storage and collection programs for recyclable materials. Generators should be encouraged to flatten plastic to reduce air space taken in storage and collection.

● Processing

Plastics like mixed metals need to be separated by resin type to command top price in the secondary materials market. Processing includes separation of materials by resin

type and baling for load limits for long haul to San Francisco or Portland. The baler should have a perforator to allow for maximum densities.

The most marketable of the plastics is PETE. When baled, the revenue will exceed the cost of collection, processing and haul.

There may be a reuse value in durable plastics. These items include: planter pots, toys, computer casings and tires.

Although the polyethylenes, (HDPE & LDPE) have markets and value, the price of collection and haul may not pencil out. However, there are many examples of enterprises that grind and press ethylene based plastics into usable products. Recycling and composting bins are typically made of polyethylene based materials. Ethylenes could be mixed together and ground into small particles and melted into a dough. The melting point of plastic is very low and needs little heat and has minimal emissions. The dough is placed on a hydraulic press and a product is formed. This labor intensive industry could provide jobs from a feed-stock that was formerly landfilled.

- **Marketing**

Markets for PETE are already established. Reusable and repairable plastics should be self hauled to a reuse center. A feasibility study with EPA Jobs Through Recycling (JTR) grant funding should be explored. The American Plastics Council is also interested in providing equipment to agencies that will look for local based industries for recycling plastic.

Short-term Priorities

- Procure baler that will perforate plastic in high density bales.
- collect and sort plastic to grade
- feasibility study for ethylene based plastic products
- create reuse center for durable plastics

Mid-term Priorities

- provide feed-stock to local plastic manufacturer.

XI. Facilities & Related Programs

The Authority should identify the pool of experienced business owners and work with them to expand, modify, and diversify their businesses to include the use of secondary resources as feedstock. Working with new business start-ups that are riskier than working with existing businesses with established, bankable track records, should be a second priority and longer term strategy. Those facilities which are unlikely to be developed by the private sector must be spearheaded by the Authority to establish a viable regional recovery infrastructure.

A. Transfer Station/Material Recovery Facility (TS/MRF)

With the imminent closure of the Del Norte Landfill, the Authority has directed staff to create a TS/MRF, which would "...offer the same types of services as the landfill now offers County residents." The following functions are being incorporated into the design and permitting for the TS/MRF. There will be two phases to the construction process and the operator will be involved in the design (see charts below), as they will have some flexibility and incentive to increase material recovery and decrease disposal. The Authority plans to own the site and building and permits, and will contract to a private company for design, operations, and permit administration. The Authority will also own at least two years of disposal capacity, but will provide a contractual incentive to have the TS/MRF operator continue to seek out and use less expensive, legal, environmentally sound disposal.

Functions & Elements, Policies & Objectives

This is a summary of the Authority Board's direction to have the TS/MRF "offer the same types of services as the landfill now offers County residents," the functions in the table below will be incorporated into the design and permitting process for the Transfer station / materials recovery facility. Note that the TS/MRF is envisioned as a two-phase construction process, and that the operator would be involved in design and will have the flexibility and some incentive to increase material recovery and decrease disposal. The Authority would own the site, building and permits, and would contract to a private company for operations. The Authority would also own at least two years of disposal capacity, but give a contractual incentive to have the TS/MRF operator continue to seek out and use less expensive, legal, environmentally sound disposal.

Table XI - 1 : Phases of Del Norte Transfer Station / MRF Development

Phase 1: Now - 2002			
<u>On-site:</u> Scale / Scale house Self-haul refuse dropoff Wood & brush dropoff Animal dropoff / storage Sludge processing & storage (Skimmings, screenings, & sludge) White goods, refrigerators, bulky item processing Administration offices Tires dropoff / storage HHW (oil, batteries, paint, anti-freeze) Facility for transfer trucks	<u>On-site Private Options:</u> HHW Facility Salvage / resale Any Phase 2 function Operator recovery Processing recyclables	<u>Plans / permits:</u> Siting Element Waste Gen. Study Markets studies RMDZ expansion Recovery Directory CEQA document WDR from RWQCB AQMD review Coastal grading Conditional use SWFP from CIWMB Tire facility Compost facility HHW permits	<u>Other facilities:</u> Composting Auto wrecking Oil buyback
<u>Phase 2:</u> 2002 -			
<u>Additional On-site, if not implemented in Phase 1:</u> HHW Facility Salvage / resale	<u>Potential Private, location uncertain:</u> Dropoff / buyback Construction Mat'l recovery & resale Textiles recovery Paper shredding Composting Baling & grinding Sorting Line Volume Reduction		Auto dismantling

B. Resource Recovery Park

The Resource Recovery Park will be a central facility to which the public can bring all their recoverable materials at one time, to decrease their wastes (at a lower tipping fee than the Landfill), recover some value from the sale of their most valuable materials and buy other items of value from the retail stores at the Park. The Resource Recovery Park will be designed to receive source separated recyclables, organics, construction and demolition debris and reusables to process, reuse, recycle and sell. The Resource Recovery Park will have a variety of reuse, recycling and composting businesses colocated in one area, that will derive efficiencies from working together. For the public, this will be a one-stop service center for reuse, recycling and composting. For the businesses in the Park, it will be a way to simplify expanding or starting new services (e.g. by having a Master EIR approved in advance to cover most anticipated Park activities) and provide an opportunity to share the overhead, equipment and operating risks. For the Authority, this will be an opportunity to

decrease the self-haul traffic to the current landfill, directing people to the Resource Recovery Park first with all their recyclables, and encouraging the public through the rate structure at the Landfill/Central Transfer Station, to keep their materials separated for reuse, recycling and composting, rather than paying increasingly costly disposal fees.

Discard management companies within a Zero Waste Resource Recovery Park can be organized into four groups:

1. Reuse: salvage, repair, rehabilitation, and retail sales for reuse items.
2. Recycling: dropoff, buyback, and curbside collection for source-separated or lightly mixed materials including cans, bottles, paper, textiles, scrap metals, and polymers.
3 Composting: fee-based collection and processing for plant debris, wood, soils, ceramics, mixed demolition debris, food paper, and putrescibles, including discarded food.
4. Processors and manufacturers adding value to recovered materials.

In physical layout, the resource recovery park should put reuse first, recycling second, composting third, and wasting last. Each module ahead of the wasting one will need to provide a small waste-handling and transfer capacity. The more effectively residents are trained to use the new system, the less waste there will be to handle at the tail end of the process.

In managing the Resource Recovery Park, it is important to let the market determine the details of where, how, and to whom materials move. Source separation principles should govern, along with convenience, cleanliness, and satisfying the customer

It is axiomatic in recycling practice that the more the discard supply is separated into discrete subflows, the more money there is in the system. As the Resource Recovery Park succeeds in its mission to attract and nurture businesses that add value to discarded feedstocks, the number and variety of such businesses can and will grow.

There should be room in such a Resource Recovery Park for many small operators. As a customer draw, clustering small with large operators is a well-proven commercial principle, as any visit to a mall will attest. There, specialized vendors of all sizes meet to offer wares and services to crowds of customers, many of them out just to explore the environment and spend a little money. If they were run as isolated businesses, most of these enterprises would fail. But within the managed competition and cooperation of the mall environment, they thrive.

The same forces will drive the proposed Resource Recovery Park. Companies will become suppliers to one another, partly to shave overall disposal costs by taking advantage of opportunities to recycle, partly to increase their cash flow, and partly just to build friendly networks in anticipation of beneficial trades to come. Information will pass readily among businesses, and all will enjoy new opportunites to learn from one another the latest and most advantageous techniques.

As the combined operation attracts more trade, the presence of so many people will create new niches for support businesses such as restaurants, accounting and legal

service providers, insurance companies, maintenance companies, training firms, and radio and telephone communications systems. A business ecosystem will gradually emerge that feeds on resource flows from the larger economy, adjusts to surges and droughts, and dries up waste before it has a chance to happen.

In addition to reuse and recycling businesses, the Resource Recovery Park will provide administrative support (e.g. computers, phones, bookkeeping, accounting and legal services) on a shared basis for a fee, shared equipment (e.g. fork lift, balers, wheel loaders, trucks), shared knowledge and technology (facilitated networking among Park tenants on how to address technical problems), shared showroom for retail sales and temporary staffing support (including training area for new staff and for tours). Once the basic operations are underway, such a Resource Recovery Park should be able to attract retail stores and consignment stores for materials and products recovered and a restaurant/snack bar for Park businesses and customers.

Depending on the location of this Park, additional benefits might include a nature trail, demonstration sites (e.g. use of compost products in gardens, on-site composting bins for residents and businesses, demonstrations of recycled building products in use, integrated pest management and water conservation) and an environmental education display/museum as an additional attraction for residents to come.

Figure XI - 1 Sample Activities Diagram for a Resource Recovery Park

Figure XI - 2: Sample Site Plan for a Resource Recovery Park

Resource Recovery Park Amenities

Additional resources should be spent to make the Resource Recovery Park (RRP) a destination point. In other words, there should be many reasons why the local population and visitors would want to drive to the Park. Areas should be set aside to hold these activities which can be built as tenants actually locate to the Park. Costs to develop these areas should be identified immediately and built into the overall costs of the Park, even if they won't be built until some future time. Funding for these areas need not come from solid waste funding sources. For example, the Park and Recreation Department could provide funding for a children's playground and small amphitheater. Of course, this means including other government departments into the planning process for the Park so they buy into the concept. Here are some examples of possible site amenities:

- **Resource Incubator**

The first step of implementing an Resource Recovery Park would be to develop an incubator for new recovery businesses which add value to recovered materials. The RRP will provide a lower cost environment for such businesses to grow and prosper.

- **Demonstration Site**

Develop a compost / native plant / Integrated Pest Management / Recycled Water demonstration garden. This area might be located on either side of the pathway to the main entrance of the Resource Recovery Park.

- **Showroom Outlet**

Develop room to showcase products manufactured, remanufactured at this site and for other reuse/recycled content manufacturers in from the Border Coast. Products would be available for sale from the Showroom and guides would be available to other resale/stores to purchase other merchandise. The artist in Residence would also show work and temporary displays could be used to show children's environmental theme projects.

- **Artist in Residence Program**

Develop area for workspace for artist in residence. Some space in the demonstration garden could be set aside for sculpture especially art from scrap.

- **Nature Walk**

Develop pathways, interpretive and warning signs, viewing platforms near points of interest (e.g. old logging ponds, lakes, animal habitat) – all built from reuse/recycled content products and act as a place for community education

- **Children's Playground**

Develop playground equipment, surface finish, fencing – all built from reused or recycled content materials

- **Amphitheater**

Develop a small outdoor amphitheater for summer programs – arts and nature – provides for the opportunities Recycletown in Sonoma provides.

- **Classroom Facility**

Develop at least one classroom that can used to host community programs from Master Composter / Commercial Auditor to art classes to nature interpretive courses.

Types of Incubators

An incubator for new recycling businesses could provide a lower cost location for these types of business to grow and prosper. There are different types of incubators that could be implemented in the Resource Recovery Park, including:

- **Graduating Incubator**

In this type, the start-up business is provided with certain resources that are shared among the other start-ups. These service include but are not limited to conference rooms, copiers and faxes, receptionists, bookkeeping, business technical assistance such as review of business and marketing plans. The goal of the incubator is to support its businesses until they are strong enough to move to their own location.

- **Non-graduating Incubator**

In this type of incubator, the management organization supports the start-ups until they are strong enough financially to purchase the facility and become fully independent. In this model a single agency, non-profit, or business could be the incubator administrator, or several businesses could co-own the facility.

The Border Coast should develop one or more Incubators to support Reuse and Repair industries. An example of this "Resource Incubator" would include a central drop-off site for reusable goods. Other value adding businesses would use these resources as feedstock for their operation. For example, an electronics repair shop, a household appliance store, a furniture store, vintage clothing and consignment shop, a household item thrift shop, a stove and porcelain refinisher, an antique restoration firm, an eco-artist and other businesses would co-locate around this drop-off center. This incubator should start with enough room for 40 businesses and include all kinds or 'Re" businesses, repair, reuse, refinish, rent, restoration, restore, etc. and of course some recycling businesses.

The Authority would identify sites for this Incubator, support the growing or creation of new businesses by providing grants and other management services and act as a central point for business attraction and marketing of this new center. The Authority could also provide initial rent supports and technical assistance in the form of business and marketing plan review, bookkeeping and tax advice. This service would probably be given under contract to a CPA or Small Business Consultant rather than by Authority staff. A non-profit organization could be created to manage the operation with oversight provided by The Authority.

Potential problems from this type of facility include illegal dumping, marketing and attracting foot traffic (customers). The Authority should continue to provide support by subsidizing the cost of collection and disposal of illegally dumped garbage and by covering the costs of marketing the "Re" businesses. The Authority could sponsor annual or semi-annual Re-Fairs to alert the community and tourists to the Resource Recovery Park. The County could support this type of service to the community by fast tracking permitting or waiving permitting and development fees. A portion of the sales tax derived from the resale of items that used to be landfilled could be used to cover the costs of managing the incubator.

An incubator could stand alone or be co-located within the Resource Recovery Park described above. This is proposed as a "non-graduating" incubator, designed to have successful businesses to stay in this park, with new businesses beyond the original ones being accommodated in locations adjacent to the initial incubator facility, or by moving some of the shared services (e.g. restaurant, showroom) to adjacent buildings.

Next Steps for Resource Recovery Park

There are a variety of ways that this Park could be established, with different roles for the Authority, including options in which the Authority:

- Conducts a Feasibility study to examine which clusters of recovery businesses would most likely benefit from locating within a Resource Recovery Park, develops a sample site layout, and administrative handbook. These key tasks will be completed through a Resource Recovery Park Feasibility Study, funded in part by a grant from the US Forest Service. (Anticipated completion: September 2000)
- For development of the Resource Recovery Park, prepare a Master EIR for all anticipated uses in the Park so that individual businesses will not need to prepare an EIR before siting there.
- Assign and budget for staff to work with all businesses siting in the Resource Recovery Park and vicinity, including: expediting permitting; dealing with local, state and federal regulators (air, water, solid waste); highlighting the public purposes of this project with planning and zoning departments; commenting on site layout and leveraging of local resources; help for start-ups; setting up tax systems and generally assisting the entrepreneur to focus on their business and not get bogged down in regulations and paperwork.
- Secure land and building for Park, obtain permits for Park and lease space to tenants.
- Arranges access to land and building under a long-term lease (possibly with option to buy), obtain permits for Park and lease space to tenants.
- Adopts policy and encourages private investor or existing nonprofit to develop Park.
- Establishes a new Nonprofit to develop and manage Park, with Board of Directors including all businesses in the Park
- Establishes a Coop to develop and manage Park.
- Pursues a combination of the above, as a public/private partnership.

The Authority should consider the interplay between the contract for operations of the Landfill (and later the TS/MRF) and the Resource Recovery Park. Disposal and TS/MRF policies and operations should support the development and expansion of the Park. To do this correctly, payment for TS/MRF operations should not be based on $/tons landfilled. Instead, the contractor of the Central Transfer Station should be paid based on the quantity of materials discarded at the TS/MRF. Any increase in reuse and

recycling at the TS/MRF, whether these materials are processed at the Resource Recovery Park or elsewhere, will reduce the Operator's hauling and disposal expenses.

Administration of the Resource Recovery Park will require skills in marketing, management, recruitment of businesses and community. The park functions could be assumed in part by the Authority staff, or contractors, for the following functions: site owner, scalehouse/gatekeeper, Park Manager, Retail Stores and Administration.

Table XI - 2 What Goes Where?

Landfill/Central Transfer Station

- Mixed Solid Waste/Garbage from Residents, Institutions and Businesses, Self-Hauled or brought in Commercial vehicles or debris boxes (if if looks like garbage, it goes here)

Resource Recovery Park

- Source separated Recyclables, Organics, Construction & Demolition Debris, Self-Hauled or brought in Commercial vehicles or debris boxes (if it looks like recyclables, it goes here)
- Reusables

Rural Transfer Stations

- Mixed Solid Waste/Garbage from Residents, Institutions and Businesses, Self-Hauled
- Source Separated Recyclables, Organics, Construction & Demolition Debris and Reusables

Other Facilities

- Julindra: Source separated and commingled Recyclables, direct from public and from Del Norte Disposal
- Hambro: Source separated organics, including yard wastes, wood wastes, food wastes and food contaminated paper, in commercial vehicles from Resource Recovery Park, transfer stationsdirect from public and landscapers and t
- A1Wrecking: Cars, white goods (from transfer stations) and tin cans (from Julindra and direct from public)
- Thrift Stores: Reusables and textiles direct from public
- Repair Shops: Large and small appliances, from Resource Recovery Park and direct from public
- Takebacks: Grocers for beverage containers and plastic bags; tire retailers for used tires

XII. Residuals & Disposal

A. Garbage is an Unfunded Mandate: Policies for Residuals

Unfunded mandates are laws passed at the national and state level which place additional responsibilities on local communities without a mechanism to pay for the required programs. Trash disposal is an unfunded mandate in that the local requirements for litter cleanup, as well as the costs for establishing, maintaining and closing collection, transfer, and disposal facilities can only be paid by additional local user fees or taxes. Section VII. D. includes recommended policies related to residual materials, service voids, and service opportunities.

B. When Disposal Is the Best Option

For some discarded materials which pose a threat to public health or the environment, disposal may be the best currently available management option. For example, the Crescent City Landfill currently has specific handling and disposal procedures for non-friable asbestos and treated, contained medical wastes. Until recovery technologies are available for these materials which do not increase the risk to public health or the environment over landfilling, these materials are best landfilled - even under a policy of Zero Waste. A fully-implemented Zero Waste program would, however, collect the disposal fee at the point of purchase so products which are more expensive to handle as discards have a matching increase in purchase price.

C. Disposal? In a Zero Waste Plan?

As important as planning for future expansion of recycling and resource recovery is, the Authority has limited resources. Since 1987, the North Coast Regional Water Quality Control Board had a Cease and Desist Order over the Crescent City Landfill, and one of the principal responsibilities of the Authority was to plan and pay for the phased closure of this facility - at a cost of over $3 million dollars from a community of 30,000 and a median household income some 30% lower than the State average[14]. The mandated post-closure maintenance costs for the landfill - which are normally funded by funds set aside for financial assurances - remain as a pledge of revenue from a facility which is not yet built.

The Authority should be a strong advocate for landfills to meet the highest environmental standards required by law to level the playing field relative to waste diversion activities and to regain the public's trust. Best available control technology should be used to comply with State and Federal standards. The Authority should be a strong advocate at the State and Federal level for the most stringent standards possible

and should support an aggressive enforcement of the State Minimum Standards for Solid Waste Facilities.

The path to Zero Waste will be made by taking one step at a time. An essential message of this plan is that managing discards as wastes creates material and energy inefficiencies by ignoring the future private and public costs of replacing those products and materials which have been wasted.

Simultaneously, materials processing often concentrates and comingles residual by-products. For example, when a recycling center removes contaminating materials from papers collected for recycling, the small and mixed bits of residual materials removed are considerably more difficult to recover. Almost by definition, such process wastes are more co-mingled and contain a negligible percentage of usable materials. The characteristics of this and similar residual streams will vary depending on the effectiveness of the generators waste prevention programs, the processes involved, separation costs, the geographic location of the waste, the sophistication of the recycling infrastructure, and economics.

Management of such process wastes for the medium term future may still include technologies such as landfilling (intermediate to long-term treatment and storage) and incineration (waste-to-energy). Two residual management alternatives that have promise to improve traditional landfilling are bioreactors and cleanfills.

Bioreactors are lined waste management units (in compliance with 40 CFR Part 258, RCRA Subtitle D) that recirculate leachate to decompose and stabilize waste faster and more completely than can be accomplished in a dry-tomb landfill. Landfill gas would be collected and utilized to produce thermal, mechanical, and electrical energy. Once the wastes were treated/stabilized and an economical end use was identified they could be mined and processed to make room for new waste. While it is not be necessary to separate inert from putrescible wastes it makes the operation of the bioreactor more efficient and makes it easier to recover the end products (soil products and recyclable materials).

Bioreactors are being designed and tested at a number of locations nationwide with promising results. It will be important to keep track of the waste types and quantities that are placed in these waste management units so that future end uses could be identified. If the wastes were shredded before being landfilled they would break down faster and be easier to process when they were mined. Leachate injection and gas extraction systems should be installed as the waste is placed.

The second alternative is referred to as a cleanfill. This is a management alternative for inerts such as glass, concrete rubble, asphalt, glass, plastic and other specialty industrial waste streams. If an immediate economic end use (such as a road building or agricultural applications) could not be identified these inerts would be landfilled (stockpiled) and mined, as needed, in the future. This type of waste management unit would probably not require a liner and would only accept selected, non-putrescible wastes. Recovery operations could be made more efficient if wastes such as plastics were baled prior to landfilling, specialty wastes were segregated, and the quantity and type of materials were be logged and mapped as they were placed.

Both of these alternatives are already being employed to some extent in other communities. To recover materials in future, however, they will require efficient mining and processing equipment and techniques.

Finally, for those materials which are placed in a landfill, bioreactor, or clean fill, the final land use plan for such areas should continue to strive for the highest, best use of the resulting fill. In Del Norte, for example, the final topography of the Crescent City Landfill after closure will provide approximately 8 acres on top of the landfill with both spectacular views of the surrounding Lake Earl Wildlife Area and potential for future development of wind power resources. Finding new ways to add value to discards is the crux of Zero Waste. If the potential added value is scenic elevation or fill supporting further development, using that value is just one more step towards Zero Waste. The key here is that finding value in disposal is the opportunity of last resort in a Zero Waste Plan, and is explored only after serious and thorough consideration of alternatives which more effectively conserve discarded resources.

Appendices

Appendix A: 1997 Del Norte Discard Study Details
- Material Classifications
- Del Norte Discard Study 1997 Summary Sheets

Appendix B: Illustrations from Strategic Recycling, by Kay Martin

Appendix C: Glossary

Appendix D: Related Policies and Resolutions
- Resolution 99-03: In Support of Citizen, Local and National Actions to Use Recycled Plastic in Beverage and Other Food Containers
- Board Minutes and Staff Report regarding Policy Supporting Recovery Businesses
- Resolution of the Local Task Force

Appendix E: Group Notes from Border Coast Regional Recyclables Marketing Summit
- Reuse & Salvage
- Construction, Deconstruction & Demolition
- Organics
- Scrap Metals
- Traditional Recyclables: Containers and Papers

Appendix A: 1997 Del Norte Discard Study Details

Material Classifications

The following definitions were used during the 1997 Del Norte Discard Study. When a material was a composite of more than one material, the item was considered to be made entirely of the material which comprised the greatest weight percent of the item. For example, a glass jar containing food was considered to be all food if the food in the jar was likely heavier than the jar itself.

Table A - 1: Material Definitions for 1997 Del Norte Discard Study

Material Type	Definition	Examples
Cardboard	this category includes all cardboard with the wavy center piece that is uncoated and all paper bags made from the brown kraft paper.	shipping and moving boxes, pieces of cardboard boxes, paper grocery bags, brown fast food bags, shopping bags, heavy-weight pieces of kraft paper. Chip board and plastic bags not included.
Newsprint	this category includes everything that would be included in a delivered newspaper and all items made from newsprint.	newspaper and glossy inserts, free advertising guides, election guides, and tax booklets.
White Ledger	uncolored bond, rag, or stationary grade paper. It may have colored ink on it. When the paper is torn the fibers are white.	copier paper, standard printer paper, and notebook paper.
Other Office Paper	other common types of paper found in an office.	computer form paper, manila folder and envelopes, index cards, white envelopes (w/ or w/o windows), and colored ledger paper.
Magazines & Catalogs	items made of glossy coated paper. The paper is usually slick, smooth to the touch, and reflects light.	glossy magazines, catalogs, brochures, and pamphlets.
Paperboard	a heavy paper product usually used for packaging boxes. This will when torn, the fibers will be either brown of gray.	cereal boxes, toy packages, arts and craft paper.

Material Type	Definition	Examples
Other /composite paper	items made from paper but combined with large amounts of other materials such as wax, plastic, glues, foil, etc.	waxed cardboard, aseptic packages, wax coated milk cartons waxed paper, tissues, paper towels, blueprints, sepia, onion skin, fast food, wrappers, carbon paper, self adhesive notes, photos, books and phone books, and egg cartons.
Clear glass containers	clear glass beverage and food containers with or without a CRV lable.	whole or broken clear soda and beer bottles, fruit juice bottles, glass peanut butter jars, and glass mayo jars.
Colored glass containers	another glass beverage and food containers with or without a CRV label container that is not clear.	colored beer bottles, colored wine bottles, and colored glass food jars and bottles.
Flat/ Window glass	clear or tinted glass that is flat.	house window glass, auto glass (not the windshield), safety glass, and architectural glass. This does not include curved or laminated glass.
Other glass	glass that can not be put into any of the other categories. This means articles that are mostly glass but combined with other non-glass materials	Pyrex, Corningware, crystal, table ware, windshields, curved glass, and laminated glass.
Tin/Steel cans	rigid containers made mainly of steel. These items will stick to magnet and may be tin coated and used to store food, beverages, paint, and a variety of other products.	canned food and beverage containers, empty metal paint cans, empty aerosol cans, and bi-metal containers with steel sides and aluminum ends.
Major appliances	major metal appliances, often coated with enamel paint.	refrigerators and freezers, stoves, ovens, water heaters, dryers, and washers.
Ferrous metals	any iron or steel that is magnetic or any stainless steel item. This does not include tin/steel cans.	structural steel, metal clothes hangers, metal pipes, stainless steel cookware, security bars, and scrap ferrous metal.
Aluminum cans	any food or beverage container made mainly of aluminum. Not including bi-metal cans.	beer and soda cans, some pet food cans

Material Type	Definition	Examples
Other non-ferrous metals	any metal item other than aluminum cans that is not stainless steel and that is not magnetic. These items may be made of brass, aluminum, copper, bronze. Lead, zinc, or other metals.	aluminum window and screen door frames, aluminum siding, copper or aluminum wiring, shell casings, brass pipe, non-magnetic silverware, and aluminum foil.
Mixed metal	metal that can not be put into any other metal category. This include items made mainly of metal but combined with other materials. These items can be made of ferrous and/or non-ferrous metal. Small appliances would be in this category	toasters, small appliances and electronics, computers, televisions, radios, and some car parts.
HDPE (#2) plastics	high density polyethylene containers with a #2 inside a recycling triangle on the bottom. These container are usually cloudy white in color allowing light to pass through them, but some are solid colored not allowing light to pass	milk jugs, water jugs, detergent bottles, some hair care bottles, empty and clean oil bottles, empty anti-freeze containers, and most other vehicle fluid containers.
PET (#1) plastics	polyethylene terephthalate containers with the #1 in a recycling triangle on the bottom. This symbol may also be accompanied by the letters “PETE” or “PET”. These containers are usually clear or transparent.	soft drink bottles, water bottles, cooking oil containers, and some aspirin bottles
Film Plastics	flexible plastic sheeting often labeled #4. It is made from a variety of plastic resins including HDPE and LDPE. It can easily be contoured around an object by hand	shrink and pallet wrap, plastic garbage bags, food bags, dry cleaning bags, grocery store bags, packaging wrap, and food wrap. This does not include rigid bubble wrap.
Durable Plastic Items	plastic items other than PETE and HDPE containers and film plastics. These items are made to use more than once	outdoor furniture, toys, sporting goods, plastic housewares, vinyl siding, vinyl window frames, plastic buckets, electronic housings, and plastic pipes, appliance that are mostly plastic, and plastic utensils.
Other Plastics	any plastic item that does not fit into any other plastic category. This includes polyvinylchloride (#3) polypropylene (#5), polystyrene (#6), other plastics (#7), and composite materials made mostly of plastic	auto parts made of plastic attached to metal, rigid bubble wrap, straws, foam cups and packaging, packaging peanuts, and cookie and muffin trays.
Food	materials resulting from the processing, storage, preparation, cooking, handling, and consumption of food. This would include materials from restaurants and home use. This does not include meat or fish scraps.	dairy products, egg shells, fruits, vegetables, bakery wastes, and other food scraps other than meat and fish

Material Type	Definition	Examples
Meats & Fish	Any material that can be considered meat or fish scraps.	any meat or bones, processed meats, fish sticks, pizza with meat, gravy, and sauces with meat.
Leaves & Grass	any plant material, except woody materials.	leaves, grass, soft plants, soft stems.
Prunings	all woody plant and tree trimming up to 4 inches in diameter	shrubs, brunches under 4 inches in dia., rose bush trimmings, small Christmas trees, and twigs.
Branches & Stumps	all wood plant and tree materials over 4 inches in diameter	fire wood, logs, trees, and large branches
Textiles	items made from thread, yard, fabric, or cloth	clothes, fabric, drapes, and all natural and synthetic cloth fibers. This does not include cloth or fabric covered items or leather items.
Other & Fines	other organic materials that can not be classified as any other organic material. This does not include ceramics.	leather items, carpets, cork, hemp, rope, garden hoses, rubber items, hair, and carpet padding, and sponges. This will also include the fines leftover after each sort.
Ceramics	pottery and other ceramics made from clay or clay bases.	clay vases, ashtrays, clay paper weights, and some tableware and kitchenware. This does not include porcelain or china.
Untreated Wood	dimensional lumber that has not been treated in any way.	unpainted dimensional lumber, unfinished furniture made of solid wood, wood siding scraps, form stakes, and header scraps.
Treated Wood	wood and lumber that has been treated in any way, painted, stained, or laminated.	painted wood items, plywood, old painted boards, furniture and cabinets with applied finishes, engineered lumber, pressure treated lumber, and lumber with water repellants.
Concrete	products made from sand, gravel, cement, aggregate, and water.	pieces of foundations, concrete paving, and concrete blocks. These may contain steel reinforcement
Asphalt Paving	Bitumen material mixed with aggregate and used as a paving material.	black road and driveway pieces

Material Type	Definition	Examples
Asphalt Roofing	Composite roofing shingles and other roofing materials made with asphalt.	asphalt shingles, roofing tar, and tar paper
Gypsum Board	wall board made of a sheet of gypsum sandwiched between two layers of paper	sheetrock, drywall, gypsum board, plaster board, gypboard, gyprock, and wallboard.
Rocks & Soils	rock pieces of any size and soil, dirt, ceramics, and other matter.	rock, stones, sand, bricks, tiles, porcelain toilets, and soil.
Composite C & D	means construction and demolition materials that do not fit into any other category. This may include items from different categories combined and not easily separated.	brick, insulation, parts of walls, and sections of roofs.
Household Hazardous Wastes	means any liquid cleaners, non-empty aerosols, batteries, pesticides and herbicides, medicines, automotive and equipment fluids, undried paint, over 10 flourescent light bulbs, and other materials that may contain any hazardous materials.	
Bulky materials	means large hard to handle items that do not belong in another category.	mattresses, box springs, fiberglass showers and tubs, recliners, sofas, and furniture
Sewage Sludge	means residual solid and semi-solids from the treatment of domestic water or sewage, including manures.	
Diapers & Feminine Hygiene	soiled cloth diaper, disposable diapers, and all absorbent fem. hygiene products.	
Medical Wastes	means all medical products that are not medicines. This includes needles, used bandages and other items that may be contaminated with bodily fluids such as prophylactics and contraceptive products. This does not include fem. hygiene products.	Autoclaved biohazard bags from medical facilities, home sharps containers, used bangdages
Tires & Rubber	means automotive, equipment, and bicycle tires with and without rims and other product made of rubber.	tires, inner tubes, neoprene hoses, wet suits, rubber gloves, and rubber bands.

Del Norte Discard Study 1997 Summary Sheets

The following sheets summarize the findings of the 1997 Del Norte Discard Study:

Figure A -1: Del Norte County Totals (Including Unincorporated County and City)
Figure A - 2: Unincorporated Del Norte County Totals
Figure A - 3: City of Crescent City Totals
Figure A - 4: Del Norte County Residential (Including Unincorporated and City)
Figure A - 5: Del Norte County Commercial (Including Unincorporated and City)
Figure A - 6: Del Norte County Institutional (Including Unincorporated and City)
Figure A - 7: Pelican Bay State Prison (Included in City and Institutional)
Figure A - 8: Self-Haul
Figure A - 9: Hazardous
Figure A -10: Total Del Norte Recycling
Figure A -11: Total Buy-Back Recycling
Figure A -12: Total Drop-off Recycling
Figure A -13: Total Recycling Collection
Figure A -14: Total Private Recycling

Figure A -1:Del Norte County Totals (Including Unincorporated County and City)

Figure A - 2:Unincorporated Del Norte County Totals

Figure A - 3:City of Crescent City Totals

Figure A - 4: Del Norte County Residential (Including Unincorporated and City)

Figure A - 5:Del Norte County Commercial (Including Unincorporated and City)

Figure A - 6:Del Norte County Institutional (Including Unincorporated and City)

Figure A - 7:Pelican Bay State Prison (Included in City and Institutional)

Figure A - 8: Self-Haul

Figure A - 9:Hazardous

Figure A -10:Total Del Norte Recycling

Figure A -11:Total Buy-Back Recycling

Figure A -12:Total Drop-off Recycling

Figure A -13:Total Recycling Collection

Figure A -14:Total Private Recycling

Appendix B: Illustrations from Strategic Recycling

Figure B-1: Solid Waste Life-Cycle Assessment
Figure B-2: State Laws and Voluntary Agreements for Minimum Recycled Content
Figure B-3: Linear Management System
Figure B-4: Cyclical Management System
Figure B-5: Mining the Rates
Figure B-6: State Disposal Bans

Figure B-1:Solid Waste Life-Cycle Assessment

Figure B-2: State Laws and Voluntary Agreements for Minimum Recycled Content

Figure B-3:Linear Management System

Figure B-4:Cyclical Management System

Figure B-5:Mining the Rates

Figure B-6:State Disposal Bans

Appendix C: Glossary

ADF (Advance Disposal Fee)	a fee charged at the point of purchase to pay for the disposal or recovery of that product or material
Authority	when capitalized, this term refers to the Del Norte Solid Waste Management Authority, a joint powers authority of the City of Crescent City and the County of Del Norte
ban	formal prohibition of a specific material from a particular use, facility, or jurisdiction
boycott	a coordinated avoidance of a specific material, product, or company, to express protest or to coerce
capture	the proportion of material recovered by a collection system
CIWMB (California Integrated Waste Management Board)	the principle State agency responsible for administering and enforcing laws and regulations related to integrated waste management and disposal
clusters	groups of recovery facility operators, discard processors, recycling-based manufacturers, and/or resale businesses which benefit from locating close to one another
collection	pickup and transport of discards
deconstruction	the act of dismantling buildings or structures is such a way as to maximize the reuse of building materials, separate the remaining materials for recycling and minimize or eliminate the amount of materials to be landfilled.
deposit	a fee collected at the point of purchase which may be redeemed at the point of collection
discard	a product or material which has minimal value to the original owner, and can include materials which are to be reused, resold, recycled, composted, or disposed
disposal stream	the entire variety and quantity of materials disposed from a region or generator
disposal	landfill or incineration
diversion	see recovery
DNSWMA	the Del Norte Solid Waste Management Authority, a joint powers authority of the City of Crescent City and the County of Del Norte
end-user	mills and other industrial facilities where recovered materials are converted into new products

EPR (Extended Producer Responsibility)	actions by or mandates upon manufacturing, packaging, and/or retail companies to share responsibility for the costs or management of the infrastructure for collection, processing, recovery, or secondary manufacture of their products or packages after discard.
ESJPA	the Environmental Services Joint Powers Authority of the Regional Council for Rural Counties in California
feedstock	materials ready for manufacture
franchise	an agreement giving exclusive collection rights within a defined region or customer base, commonly used for municipal garbage collection contracts
generator	the resident, commercial business, or institution which discards
HDPE (high density polyethylene)	the hard, translucent plastic used to make milk jugs, and which is frequently colored for other packaging applications.
ISO 14000	a family of generic management standards involving certification, registration and accreditation of an organization's processes and actions to minimize harmful effects on the environment caused by its activities.
LDPE (low density polyethylene)	the most common film plastic, often used to make plastic bags
LEA (Local Enforcement Agent)	the government employee responsible for local enforcement of laws administered by the CIWMB
listserves	subscription-based distribution networks for electronic mail, usually pertaining to a specific topic which is of interest to the subscribers
market	a purchaser of secondary materials: end-users are a market for processors, and processors are a market for collectors
mini-can program	providing larger, convenient receptacles for recovery and much smaller containers for disposal
OCC (old corrugated cardboard)	the grade of cardboard most commonly collected by community recycling programs
on-site sales	sales of discards at the point the items are discarded, such as garage sales
on-site management	separation, storage, and processing of discards prior to collection
ONP (old news print)	the grade of newsprint most commonly collected by community recycling programs

PAYT (pay as your throw)	disposal rate structures with an equal cost per volume or cost per ton, regardless of the quantity disposed.
permit fees	fees assessed with the issuance or renewal of a permit
PET (polyethylene terephthalate)	the plastic resin most commonly used for soda bottles
process wastes	materials discarded during processing or manufacture
processing	sorting, grading, cleaning, densifying, or packaging of secondary materials
PSA (public service announcement)	a formal release of public information to be broadcast in newspapers, radio, and television for community benefit
recovery	reuse, repair, recycling, or composting
Recovery Ordinance	a formal policy establishing a deposit, fee, fine, or mandatory program for the proper recovery and/or disposal of targeted materials that is levied at the point of purchase
remediation	treatment to remove contamination re-establish habitat
resource recovery park	a facility with shared resources housing a variety of recovery-based operations, possibly including serial drop-off of reusable or recoverable materials, businesses conducting repair, processing, manufacture and resale of products derived from secondary materials
secondary materials	materials which at one time were discarded
sector	groups of businesses and non-profits which use, manage, and/or discard similar materials
sector huddles	meetings of generators, collectors, processors, existing and potential recycling-based manufacturers, and relevant regulatory agency representatives to enable targeted sectors to improve on-site management for pollution prevention and materials recovery
self-haul	materials hauled by the generator, or contracted for hauling by the generator in an agreement outside the collections franchise agreement
serial drop-off	a facility or collection of nearby facilities designed to provide opportunities to drop off specific recoverable items or materials in separate locations
service void	specific items or materials within the disposal stream which have no local recovery mechanism
service opportunity	items or materials within the disposal stream which could potentially be recovered through existing programs, but are not

source reduction	see waste prevention
tipping	the action of discard for self-haulers and other haulers, whether at a disposal or a recovery facility
TS / MRF (transfer station / materials recovery facility)	a single facility which receives discard materials, recovers a minimum of 15% of the materials received, and consolidates the materials to be disposed into larger vehicles for transport to a disposal facility
user fee	a fee for service charged to those who use the service
variable can rates	disposal rates which encourage recovery by charging less for recovery, and which charge more on a cost per quantity basis for larger quantities to be disposed
vermicomposting	feeding selected discards to worms and periodically harvesting the worm castings, which generally make an excellent fertilizing soil amendment
waste reduction	any action which reduces waste, including waste prevention, reuse, recycling, and composting
waste	discards whose residual value is destroyed by disposal
waste stream	see disposal stream
waste prevention	modification of the design, manufacture, purchase, or use of a product, package, or material which reduces the quantity discarded
yellow pipeline	a program in which students bring their recyclable materials on the school bus to drop-off or collection centers at their schools
zero waste	elimination of waste

Appendix D: Related Policies and Resolutions

1. Resolution 99-03: In Support of Citizen, Local and National Actions to Use Recycled Plastic in Beverage and Other Food Containers

2. Board Minutes and Staff Report regarding Policy Supporting Recovery Businesses

3. Resolution of the Local Task Force

Appendix E: Group Notes from Border Coast Regional Recyclables Marketing Summit

Reuse & Salvage

GROUP:	Reuse & Salvage	
Materials or Goods Recovered:	**Ideal / Optimum system for Max. recovery**	**Ideal / optimum system for adding value to sell:**
Not so much materials as products and structure/ system or facility	-Incubator where you can start building businesses around it. -Single location for reuse, recycling & disposal. -Combine with education & $$ incentives.	-Incubator center for all "re" word activities. -use nonprofit partner to run Incubator.
Resources needed:	**Barriers to Overcome:**	
-Nonprofit or Incubator cooperative? -Land / Appropriate site -40 people / Businesses to support with County	-Sitting Issues, need to resolve tension between need to site transfer station VS. Need to start reuse now. -Need enforcement on illegal dumping issues, (need 30 - 40 people with you).	
Strategic Plan / Action Steps:		
What (short, med., long term)	**Who**	**When** / **Resources needed**
Rate Incentives		
Recovery contract @ landfill Mobil units? Temporary structure?		
Prosecutions 2-3 to establish model consciousness		
Medium term: Incubator businesses		

GROUP:	Reuse & Salvage		
Long term: Product responsibility policy & product bans			

Construction, Deconstruction & Demolition

GROUP:	Deconstruction	
Materials or Goods Recovered:	**Ideal / Optimum system for Max. recovery**	**Ideal / optimum system for adding value to sell:**
Construction Remodel Demolition - [Deconstruction of Of bldg/Mat]	Incentives to Reuse 1st then Recycle CD&L materials	Electronic Brokers- Re-Sale Stores- More End-Use Manufacturing- More Contractors- (More Recycling Options)
Resources needed:	**Barriers to Overcome:**	
Education Business Options	Partners Lack of local Housing Stock Habits and Attitudes Reuse as too "Tree Hugging" Not an Economic Benefit ! Fire Dept doing "Demo by Fire"	

Strategic Plan / Action Steps:

What (short, med., long term)	Who	When	Resources needed
Develop Team	Patti,Brian/Cal Ore	Monthly Conference calls	
Feasibility Study, Incl. Locations	Team Authority, Consultant	Sept 98 To March 99	- Waste Gen/Study - Grant $ - Site options - Mkt options

GROUP:	Deconstruction		
Financing, Permits, Start-up	Partner- new business	April 99 To June 99	-Businesses ready to start
Education / Demonstration	Team, Authority, 3 current bldg/projects, Co/development Dept. Board of supervisors "core team" CALWORKS	August 98 Oct-1998 -$ for spec writing	-pilot demo -on site deconstruction sales -construction discard reuse -case studies-press rel. -brochurs,directoies
Incentive plan for generators	-Team, Authority -County/City permit staff -Air water Board -county Health permit	Sept - March 99 research ---------- April - Sept 99 Adopt policy & ordinance if needed.	Develop incentive options based on being economically competitive to landfill.
R&R Business development	Team Authority	June 1999	Planning
Medium term-------- -permit Requirement to R&R -Start & expand manufacturers for R&R Materials	 -Authority & community development dept. -RMDZ(CIWMB) staff Board of Supervisors, SBOC,RMDZ-staff, county Economic development, Humboldt area foundation.	Sept 2001 Sept 2001	new permits & decent brochures. Site/open for bos

Organics

GROUP:	Organics		
Materials or Goods Recovered:	**Ideal / Optimum system for Max. recovery**	**Ideal / optimum system for adding value to sell:**	
Food,Sludge	2-stream col/system - source separated drop off - Mobil grinding - mandatory eventually?	High Quality Compost	
Resources needed:	**Barriers to Overcome:**		
$-raw material, data (volume) $-Equipment $-Site	-Low volume end product -Consistency of supply -Transportation to markets	-Economic feasibility -Technical process -Government regulations, ie: sludge use	
<u>Strategic Plan / Action Steps:</u>			
What (short, med., long term)	**Who**	**When**	**Resources needed**
meetings	Solid Waste/Hambro	2-weeks	Data
Feasibility study-initial	Hambro	30-60 days	Data
Final plan if loans feasible	Hambro	6-mos	Data
DNAWMA plan for raw material collection	DNSWMA	6-mos	Data
Financing plans	public and privet sector	6-mos	Data
Construction	Hambro	2-mos	Data
Operation/testing	Hambro/County	on going	Data

Notes from Organic Group

Issues:

1. Food waste @ prison & else where
2. For DN landfill is closing Organics 35-50% of landfill
3. Transportation / Collection of some brush, wood etc.

H = Hambro

Materials (Organic):

Brush and branches - **H**
Stumps - **H**
Restaurant waste / food waste
Sewage sludge - **prison & city**
Untreated wood - **H**
Paper, newsprint, cardboard
Cigarettes & filters
Road kills / dead animals
Cheese whey ?
Fish waste - **H**
Bulky waste - manufacture-wood products
Leaves and grass
Treated wood - **H**
Street sweepings

Mandatory Separation:

1.Attitude needs to change
Voluntarily or Mandatory - driven by economics of disposal=rate base
2.Needs to be more convenient
Have bins @ dump-need to advertise that they are free (Rial stations)
3.Collection system - improved clear direction on bins etc
Community education
expand (bin types)
4.Rural stations

Uses - Potential & Real:

1.Mandatory separation of organics to streams, Facilitate re - use, Include self
haulers in separations.
2.Cardboard waste - fuel pellets
3.Wood and brush-Hambro
-Burn individually
-Back yard composting
-Wood chippers
Possible -Bins for yard waste
-Processing go to "generator"

Potential -Timber Co's use chemicals
Economics of chipping or transporting
4."garbage"- Separate
Compost-backyard & commercial
5.Leaves/grass-backyard compost

Uses - Fertilizer Pellets:

1.Organic fertilizers
2.Fuel - (brush chips)
3.Chips
4.Sludge to agriculture ?
-Produce Class A Bio-solid plant (Josephine Co) @ waste
Plant
-Compost
-System @ Disney World
-Food—compost & sludge
-Target mixture to local products

Uses - food waste:

-Prison/grocery stores relatively clean
-Compost
-Require separation & clean collection of organics
-Use paper bags not plastic
-Frequent collection
-"cooked" food issues

Problems -Capital Costs
-Transportation
-Low value items
-Compost needs to have local use
-Neighbors
-Compliant/opposition to facility
-Order problems
-Product Quality
-Npk Level

Businesses:

-Eureka Protein - Meat and road kill
- Hambro
- Chippers, transportation, composter's

Ideas:
-Regional research facility - share cost / materials/ etc----Oregon / Calif
-Regional markets / suppliers

Process:
-Collect (organic) everything else
-Sort/separate Separate-food, wood waste
-Store and deliver
-Use/manufacturing markets
-Collect "Murfable" organics, separate from other's
-Separate trucks & containers

Hambro: (needs for composting)
-Stormwater drainage permits/containment
-Pole barn-storage
-Black top
-Covered"drop off" site

Players:
-Public
-Collector
-Local Gov
-Processors
-Users
-Markets

Tasks: Increase quality of materials, control feed stock & mandatory requirement.
-Set the rules: -Gov takes lead but setup as "facilitation" of privet business
-Education: -Solid waste Authority
-Collection: -Franchise & self haulers
-Transport to (Hambro): -Fed $ to help whole process, privet haulers
-Work with Ag. Dept
extension/ research:-Develop product/process(privet-ie, Hambro)
RFP,s:
-Process Market (privet Co's)

End Users: -Remember compost is "low value" so end users cost is important
must include transportation cost"$ 2.00/mile" for truck-
1.Ag
2.Cal trans
3.USFS
4.Shipping radios=?
Limited by cost think "**NORTH**"

How long does it take?
1.Public education. - voluntary sort
2.Contract up in Nov- (franchise) 3 mos
Should have options written in to accommodate new ideas/activities in next 2 years.
3.Hambro research & establish their requirements
4.State/local permits=? Short term?
5.Two parable tracks
A.Public process
B.R&D/feasibility– Hambro board—yes/no?

Funds: -Short term $ needed for tipping fees to replace $ lost from self haul to
"Free" bins or discounts for sorted materials, Where to Collect $.
-Cost of set up for Hambro is an issue !
1.Cap equipment for improvements
2.Grant or low interest loans
3.Try for a "model" project to attract TA & funds
4.ID sources of raw materials-ie Brookings ??

Evaluation/Planning process:

1.Hambro-Dwayne and Irv

2.Need a study-Authority, local Gov, public and co.

Set up a meeting-Irv will contact solid waste.

3.If meeting goes well then proceed further: feasibility

Volume of waste stream, seasonal variations etc-

4.1 year to feasibility/2 year to operation

a -Hambro can decide 30 to 60 days after solid waste provides info

b -after decision to investigate Hambro can complete study - 6 mos.

Scrap Metals

GROUP:	Scrap Metals	
Materials or Goods Recovered:	**Ideal / Optimum system for Max. recovery**	**Ideal / optimum system for adding value to sell:**
-car bodies, white goods, -tires(steel), small appliances -bulky items(steel coils) -tin cans, deconstruction.	-donation system(cans) -white goods etc to Bruce from transfer station, LF, & 40 yd bin at N.bank. -Industries bring scrap to Bruce for free dump. -mo free drop off at Bruce for Res. -set up inclosed site for mattresses, furniture, white goods, St.vincent depaul or prison. -Mandatory take back for tires	(Processing/Mkts) -Baling -Better trucking -Aggregating diff. Sources of metals -Labor to sort, repair, dismantle (prison) ? -High grade/upgrade, non-Farris metals -Tire grant for Retailers
Resources needed:	**Barriers to Overcome:**	
-Bailer, Car Crusher, -Trucking service./backhaul -donation system for old cars -Repair system & dismantling of white goods.	-On going Illegal dumping -Decreasing $ for scrap cars -Transportation/Compaction -Health Safety Issues Oil from autos, Aerosols, Batteries-Sulfuric Acid	

Strategic Plan / Action Steps:

What (short, med., long term)	Who	When	Resources needed
Pursue Tire grant	DNSWMA	Tomorrow	Retailers & Cleanup Illegal dump sites.
Meeting of all Metal Recycles & Generators	DNSWMA	Tomorrow	ID specific bailer needs and funding source
Tire take back ordinance		1-2 years	

GROUP:	Scrap Metals		
Oil $	DNSWMA	$ already here- allocated	oil filters
Jordan, (recycling)	Julindra	Tomorrow	Bailer for Jordan
Get Cascade	Auto wrecker	3-6 months	Crusher/Bailer for Bruce
couches and mattresses store some where	St. Vincent Depaul		
Drop boxes for white goods at transfer station			

Traditional Recyclables: Containers and Papers

GROUP:	**Traditional Markets**	
Materials or Goods Recovered:	**Ideal / Optimum system for Max. recovery**	**Ideal / optimum system for adding value to sell:**
Small amounts of traditional recyclables- news paper,wl,occ,plastics, Glass	Rate structure Incentive Convenience Markets for product mandatory recycling	Local - market committed to locals. consistent market.
Resources needed:	**Barriers to Overcome:**	
Cooperative Marketing Investments in technology trained employees	for collection -non mandatory garbage collection. Transportation. link between innovations & skills. funding sources. high risk /low interest loans.	

Strategic Plan / Action Steps:

What (short, med., long term)	**Who**	**When**	**Resources needed**
Look at city and county procurement.	DNSWMA / PBSP	Short term	find out what the buy
inventory forum: Teachers, students,review available materials and quantity.	DNSWMA,Rotary, Business group.	Short term	
Become a Recycling development zone	DNSWMA	Short term	Fill out paper work get Humbolt County approval
Cooperative marketing with PBSP?	PBSP	Short term	

GROUP:	Traditional Markets		
Look at Welfare to work projects with recovery and re-manufacture enterprises , business training.			
Business Incubator with Technology			

Endnotes

1. Tellus Institute, CSG / Tellus Packaging Study: Assessing the impacts of production and disposal of packaging and public policy measures to alter its mix, 1992

2. Schall, John. "Does the Solid Waste Management Hierarchy Make Sense?," 1992

3. Hayes, Dennis. “Eco-nomic Power,” *Seattle Weekly*. 10 November 1993

4. Schall, John. "Does the Solid Waste Management Hierarchy Make Sense?," 1992

5. Tellus Institute, CSG / Tellus Packaging Study: Assessing the impacts of production and disposal of packaging and public policy measures to alter its mix, 1992

6. Mollison, Bill. Permaculture: A Designer’s Manual

7. Martin, Kay. Strategic Recycling: Necessary Revolutions in Local Government Policy, Darkhorse Press, 1996. The demand-side management principles on pages 170-171 were adapted within this report to describe the difference between Zero Waste and Integrated Waste Management.

8. Nattrass & Altomare. The Natural Step for Business, New Society Publishers, 1999.

9. North County Almanacs, 1998 Del Norte County Economic & Demographic Almanac. In 1992 there were 310 Lumber and manufacturing jobs, and in 1997 there were 192.

10. EMCON, Del Norte Countywide Integrated Waste Management Plan (1992, plus amendments). This Plan is mandated by the California Integrated Waste Management Act as amended, and is the central planning document describing how Del Norte County plans to implement programs to reduce the amount of adjusted per-capita waste disposal will be reduced from 1990 levels by 50% by the year 2000. This Plan includes a Source Reduction and Recycling Element, Household Hazardous Waste Element, Non-Disposal Facilities Element, and Siting Element. The Source Reduction and Recycling Element includes Components planning for Waste Generation, Source Reduction (Waste Prevention), Composting, Recycling, Special Waste, Education and Public Information, and Integration. The Household Hazardous Waste Element plans for collection and education related to household hazardous waste. The Siting Element describes plans for disposal for the following 15 years. The Non-Disposal Facilities Element describes all facilities except landfill and incineration facilities necessary to implement the Plan, such as the Transfer Station / Materials Recovery Facility and Composting facility planned for Del Norte County.

11. California Integrated Waste Management Board, Waste Diversion in Rural California (September 1991)

12. Gainer & Associates, Humboldt County Recycling Market Development Plan, (November 1992)

13. County of Del Norte memo from Code Enforcement Officer Deputy Esparza (10 January 2000)

14. North Coast Almanacs, 1998 Del Norte County Economic and demographic Almanac. The 1996 median household income in Del Norte was $27,507 compared to the State median household income of $41,176 during the same year.