Mitch

To : Rosalie Mulé 12 March 07

From : Bob Davis

Subject : Comments on "Draft Five-Year Plan for the Waste Tire Recycling Management Program" (9 January 07)

"Some things don't change ... some need to change". Case-in-point, while I may now be electronically-linked via e-mail, I still remain more comfortable in communicating the old-fashioned way via "e-quill". Thus my comments on the subject 5-year plan are submitted herewith ... you'll just have to suffer-through my chicken-scratchings.

My comments are submitted to be constructive ... I hope they will be received in this manner. As I always tell a new employee ... "I expect you to speak-up during your first few months of employment & to voice your observations/opinions (pro-or-con) because after you are here for awhile, you'll become engrained in the mainstream of things and more apt to just 'go along with the way it is'..." As you know, I have spent over 35 years wandering around our nation in activities/occupations directly involved in solid waste ... or, as I prefer ... resource management. I have now returned home to California and am directly involved in the handling of about 10% of California's scrap tire management (I haven't changed ... I detest the word "waste" when addressing recycling/resource management). Having not been very much involved in scrap tire policies in California until now, I am trying to use the referenced "new employee policy" on myself when reporting to you on my

observations / comments regarding the 5-year plan ("Plan").

In my personal opinion, the Plan is too focused on "history" (Manifesting / Enforcement) and not sufficiently focused on "tomorrow" in terms of Research & Market Development / Support. California is blessed with a robust fund to manage a "sliver of the 'waste' stream"... scrap tires. CIWMB should place itself in a Leadership role. Data has been gathered — do not fall into an analysis-paralysis mode. Maintain an adequate data base... cleanup remaining tire piles ASAP... and move aggressively into a Research / Market Development initiative that will put California in a leadership position. Many states have done many things with tires — use and replicate successes and cultivate new initiatives... and do not artificially eliminate integral components of a successful infrastructure that endorses "Rocks-Coal-and-Rubber"(*) as keys for ultimate success (see attached comments).

I look forward to seeing you and other Board Members later this week.

Regards

B 3/12

(*) Rocks = aggregate / earth replacement = civil engineering
Coal = alternative energy replacement of finite carbon-based fuel
Rubber = material replacement for virgin / synthetic rubber

COMMENTS ON "FIVE YEAR PLAN FOR THE WASTE TIRE RECYCLING MANAGEMENT PROGRAM (9 JANUARY 2007)"

The State of California likely has the most robust scrap tire management program in the nation ... in terms of financial underpinning. A budget of over $30 million per year far exceeds the governmental coffers of any other state — &, I would guess, represents a significant percentage of all state government funds being allocated to a sliver of the solid waste stream. Tires can ... & should ... be addressed and should be a reuseable commodity that is beneficial in reuse in a wide variety of applications (or re-applications). In my travels across this country ... & having had/managed scrap tire collection/processing operations in nine states ... I believe I can unequivocally state that the states that provide regulatory guidance, support a wide spectrum of uses, and allow marketplace economics to prevail within practical compliance boundaries, are the most successful. Quite frankly, too many special interest groups attempt to push (or divert) legislative initiatives away from practicality. My firm belief is (and always has been) that legislative bodies/policy makers need to create &/or replicate initiatives that advance recycling issues within the realm of sustainable economics. otherwise, the initiatives for many "good ideas/programs" fail when an artificial underpinning is pulled-away. Once a consuming infrastructure is capitalized and in place, sustainability is perhaps not guaranteed ... but is certainly more probable of being

sustained. Above all, one must always remember that recycling is "delayed disposal" — giving an underutilized resource another chance at life before atrophying (shrinking) or becoming useless from an economical or technical standpoint. For example(s)...

* Old newspaper which is recovered & reprocessed into fresh newsprint loses up to 27% of its "recyclable weight":
  - 6-10% by weight due to moisture dissipation
  - 1-2% by weight due to ink removal
  - 10-12% by weight due to short-fiber fallout
  - 2-3% by weight due to ash, clay or other filler fallout

  If one desires to have "complete" recycling, the solid aspects of the process (13-17%) would need to be de-watered and used in another product (many failures here)... or... re-introduced to a recovery boiler as an alternative fuel source (many successes here).

* Scrap tires are generally lumped together as a homogeneous "waste" component. Nothing could be further from the truth. Passenger tires are different from truck tires which are different from off-the-road (OTR) tires which are different from airplane tires which are different from "NASCAR" tires, etc. The multiple blends of rubber (natural/synthetic), fiber, steel, additives... make this material challenging to separate into component fractions and to keep from cross-contaminating. Significant strides have been made ... & more are developing — but, as with the previous newspaper example, may require widening of acceptable applications to fully utilize the whole tire and its variety of components.

With this lengthy preface, I herewith submit my <u>personal</u> comments on the draft 5-year plan.

Prior to commenting on various components of the 5-year plan, it may be prudent to look at and compare the competitive economic thresholds that various tire-derived products must compete with for economic viability:

* "TDA" (Aggregate) must be able to compete cost-effectively with gravel ("rocks") ... say $10/ton
* "TDF" (Fuel/Alternative Energy) must be able to compete cost-effectively with coal ... used to be ~ $30/ton; should now be ~ $50+/ton
* "TDP" (Products) must be able to compete with virgin rubber or some derivative thereof depending on application ... say anything from 15-30+ ¢/lb ($300-600/ton)

Rocks
↓
Coal
↓
Rubber
↓

Thus, there is a replacement material hierarchy that must be recognized by the spectrum of stakeholders that address "tire recycling" policies and applications (legislators, regulators, processors, consumers). The result of these efforts must, again, result in a tapestry-of-interests that results in economic sustainability. At this point, due to the diverse complications of tire composition, scrap tire recycling (&/or disposition) must be supported by a collection fee paid by the generator to the collector/processor. Tires are <u>tough</u>

to separate for markets that (1) require size reduction with steel restrictions and/or (2) require size reduction with steel, fiber &/or titanium dioxide (white sidewalls) restrictions. As a rule of thumb... "halving the size doubles the cost" in terms of processing.

DATA BASE

Let's jump right into the plan's profile of current consumption categories that comprise the "75% recycling / diversion rate" (30.6 million tires). My first question is ... how are "tires defined"?

- ☐ Passenger tire equivalents @ 20 lbs / PTE ?
- ☐ Individual tire count regardless of size / weight?
- ☐ other ?

While certain that the CIWMB staff understands the importance of this issue, I will state that if the "20 lbs / PTE" measure is being used, there is a huge error (15-20%) in your base data. Due to the advent / growth of SUV's & Light Trucks, the average "PTE" is now 23-24 lbs ... not the historical 20 lbs.

Ignoring this for now, let's turn to the 2005 Diversion Table (Pg 3). I'm not certain that I fully understand all the consumption categories, but ... here goes —

Category (ies)	10^6 "PTE's		Comment(s)
Reuse (retread? grade-off?)	1.2		All three seem to be related to whole tire reuse applications & should be categorized ... some-to-none in terms of mechanical processing (retreaders would argue)
Export (grade-off?)	2.3	7.9	
Retread	4.4		
Crumb	3.2	5.2	Both require the most amount of processing / mechanical separation
R.A.C.	2.0		
Civil	2.0	6.7	Both require limited-to-some mechanical processing
A.O.C.	4.7		

continued next page

Cont...

Categories	10^6 "PTEs"	Comments
Co-Gen TDF	1.7 } 9.1	No mechanical processing (Cement) to some mechanical processing (Co-Gen)
Cement TDF	7.4	
Other	3.2	Some, at times, mechanical processing
Imported	2.0	No idea of what this is?
	30.6	FIRST... THIS ADDS TO 34.1 ... NOT 30.6 WHICH IS CORRECT ???

Thus, in the "Rocks-Coal-Rubber" hierarchy outlined earlier, California's diversion rates are:

	10^6 PTEs	%	Components
+ Rocks	6.7	16.4	Civil, A.D.C.
+ Coal	9.1	22.3	TDF (Co-Gen, Cement)
+ Rubber	13.1	32.1	Crumb, R.AC., Reuse, Export, Retread
+ Other/unknown	5.2	12.8	Other, Import
+ Landfill	? { 6.7 / 10.2	16.4 / 25.0 } ?	Landfill ... which base is correct?
	? { 40.8 / 44.3	100.0	uses numbers that total 40.8 ... i.e., 6.7 @ Landfill

NOTE: Due to a fairly obvious (& major) error somewhere (or I am reading/misinterpreting incorrectly?), it is difficult to comment on the "numerical status" & validity of these very important data. Due to this uncertainty, I can only offer suggestions for consideration.

1. Get data correct/corrected so they are useful/valid.
2. Categorize the "diversion elements" so that "degree of diversion difficulty (mechanical processing) can be addressed — I believe this criterion will make/break any recycling program & needs to be recognized when making policy for sustainability.

3. Do not artificially curtail or shut-off diversion-markets through wrongful / limited knowledge rationale — e.g.,
   * TDF via whole tires into kilns should not be legislatively limited — are 10 million tires/year (or 6.7 million ?) better/worse than being used in cement making where there is zero residual & "NOx is knocked" (down)? {Note: where are Altamont, Azusa, Copperopolis shredded tires captured? — AOC? Landfill? Other?}.
   * Retreading, exporting/internal reuse of tires is "material" use/consumption in a manner that should compete with heavy mechanical processing to produce crumb for safe surfacing, molded products, R.A.C., etc — these are "rubber markets".

In summary, I would suggest making data meaningful & practical... & correct so that practical policies/legislation results in a solid payback to Californians — safer surfaces (playgrounds, highways); lower energy costs; lighter weight aggregate applications; etc. Do not short-circuit alternatives... allow economics to prevail.

FUNDING FORECAST

The next program summary (Table 1 - Page 5) presents proposed funding for the 5 years in question... summarized below:

Enforcement	$44.7 MM	26.0%
Cleanup	27.3	15.9
Research	6.2	3.6
Markets	71.8	41.8
Manifesting	5.5	3.2
Administration	9.4	5.5
Mandatory Contr.	6.9 // 171.8	4.0 // 100.0

Does not include Program Evaluation @ $250K

ENFORCEMENT; CLEANUP

Again, looking at aggregate funding categories, Enforcement & Cleanup at ~ 42% of the proposed funding seems to be a very excessive amount. Have not all major tire piles in California been abated / remediated? Are the enforcement / manifesting programs not becoming asymptotic with being fully emplaced and working reasonably well? Why, then would such a high amount of funding be allocated here ... especially enforcement? Why could local enforcement not simply be tied to a grant? For example, if a locale receives a grant to put in a safe surface on a school district playground, the local government should be required to monitor local tire operations & make inspections ... it is not that complex & would allow funds to be reallocated to something I believe to be woefully lacking - & - underfunded ... Research (more later). Has a cost-effectiveness study been conducted on the Enforcement Grant program? What is the cost / inspection? How valuable are these data if the program has some degree of maturity (1996 - 2001/2 ... solo by CIWMB; 2002/3 - 2005/6 w/ grantees & CIWMB). What % of the "waste stream" is scrap tire(s)? How much monitoring / inspection is warranted / justified versus creating more infrastructure through research to create demand that virtually "self-regulates / enforces"? My personal opinion ... an extreme overkill and misuse of funds. 71% of the Enforcement line item is for grants — $55 million ($11 million / year) is a highly questionable use of funds. ——— Re: Cleanup ... California has performed very well in cleaning up / abating the large tire piles (64 piles in '02 -vs.- 24 in '04/'05 which are much smaller in size & number). Why would it not be good policy to knock-out the re-

maining 24 as fast as possible? Granted, their may be legal access battles, etc. — but, rather than put so much in enforcement, why not clean up the known problems & be done with it? There must be some flexibility to move funds around & prioritize application(s). {As a small note — the text/Table 3/Page 12 are not in sync ... which numbers are correct? Needs to be corrected/edited}

RESEARCH & MARKETS

The Executive Summary underscores development of a sustainable business infrastructure ... promotion of R.A.C. ... promotion of TOP & diversification ... promotion of civil-applications ... etc. Thus, "rocks & rubber" are referenced ... but, no mention of "coal" as a complementary arrow in the tire recycling quiver. In a state that has been hammered by disadvantages due to the high cost of energy (individuals & industry), I personally find a couple of statements disheartening as a citizen, industrialist and practical environmentalist:

1. Page 5 ... "Build sustainable TOP markets to increase value & diminish current economic advantages of landfill or incineration".
2. Page 18 ... "A third study ... was completed in March 2006. This study found that while these technologies* have merit, at this point in time, they are not economically feasible at commercial scales."

* Pyrolysis, Gasification, Liquefaction

In order to pursue and achieve the stated diversion goals, all aspects of reclamation, recovery, processing & consumption should remain open — especially in the realm of Research & Market Development. Why limit your scope to RAC and CE?

* Safe surfacing receives limited-to-no ink in the draft, yet the Governor is emphatic in his support and CIWMB has many grants lined-up. The University of Northern Iowa has an Institute dedicated to safe surfacing for playgrounds. This is an enormous market with high potential to consume 10's of millions of pounds of crumb rubber... why no ink or limited acknowledgement?
* RAC has heavy-ink. This should be a solid demand and, again, has the Governor's backing. Let's not forget, however, that RAC's reputation is somewhat tainted by former RAC initiatives that left numerous processors bankrupt. To my knowledge, there has never been a California RAC-project shut down by lack of rubber ... but processors have been shuttered by lack of consumption. The current "cry" that lack of crumb is a deterrent is a "bit wolfy" — supply/demand parameters may ebb/flow for awhile, but sustained markets will create supply that reaches equilibrium is given proper opportunity. Also, why does California believe it has to study/restudy RAC? There are reams of data available from all types of applications, climates, etc. (AZ, FL, TX, SC ... & Canada). Surely regulatory & governing bodies can co-operate & not reinvent another wheel.
* CE is being heralded as a new, upcoming market requiring pilot monitoring, etc. Granted, the good-Doctor from Maine has an abundance of data and studies... but CE applications are numerous and, again, should be available in a "staff-to-staff" environment between states:

- Roadbed applications ... talk to Minnesota & Wisconsin — 10's of millions of tires have been engineered into highway construction.
- Landfill cell construction / leachate collection ... look everywhere — might start with Iowa.
- Septic field drainage ... Georgia & South Carolina have used 10's of millions of tires in this application.

And the list goes on. Further, these states (& many more) have put their programs in place with a fraction of the budget &/or staffing that is available to CIWMB for scrap tire management.

This next statement may sound crude, but why would CIWMB eliminate the potential for pyrolytic / gasification breakthrough (more below) and endorse civil engineering use that blends scrap tire chips and dirt ... isn't this simply landfilling at a designated location away from a landfill? Don't get / take me wrong ... I support CE applications in the Rock-Coal-Rubber hierarchy. I have a tough time supporting elimination of an important aspect of the technical / economic hierarchy needed for sustainability.

* Alternative Energy has been soundly trumpeted by the Governor ... witness the $40 million grant to UC Berkeley in conjunction with BP Petroleum to study new biofuels. This will be a macro-study. Why would CIWMB not pursue micro-applications that refute the March '06 claim that pyrolysis, gasification, etc. are not economically feasible at "commercial scales". What is "commercial scale?" We, as a country / state can not

artificially reject any option that lessens our dependence on foreign energy sources with finite limitations — especially when our per capita cost to fund the flotilla in the Persian Gulf is equivalent to $1 per gallon at the gas pump. The Wright Brothers didn't fly on the first attempt, but there is a monument at Kitty Hawk, NC that shows where the first 200 feet of flight occured. I'm sure there were naysayers then that might have stated that "flight is technically possible, but will never be economically feasible at commercial scale." Let's not let "NEVER" be a barrier to allowing for development in the Rock-Coal-Rubber hierarchy toward contributing to the ultimate solution to optimizing scrap tire management in California. Research and Market Development is required ... don't artificially restrict it's potential.

* Steel (from the Draft report/Plan) "shows promise." Without arguing the "why's", California has driven away it's steel capacity. In areas where mini-mills still produce steel, there is robust competition for "tire wire" (Midwest, Southeast). Granted, it took some time to get mills to accept the tire-steel-furnish, but once paradigms shifted, the high alloy tire-steel with a "little rubber attached" became a sought commodity. California has some steel capacity and access to almost insatiable appetite(s) overseas. There may be a mindset change required, but markets can be developed.

* Fiber ... & ... Other Processing Residual are areas that could/should be researched. Passenger tires can contain 20-25% polyester fiber by weight (and white sidewalls ... titanium dioxide). Some

percentage (small) of fiber may be included in "RAC-rubber", but almost zero-tolerance for fiber is in specifications for molded products, safe-surfacing, etc. Further, recovered / screened fiber is cross-contaminated with rubber-fines. Thus, the "crumb residual" for TDP/RAC may be 25+% — how is this accounted for in diversion data? Similarly, TDF production has a residual if chips are required... 2-3" chips create 30-35% residual (cross contaminated steel-fiber-rubber) and 1" chips create 50-55% residual... how are these residuals accounted for in diversion statistics? Unless there is an iterative processing line that recovers "steel-free" rubber for crumbing and further processes the residual for TDF or crumbing (or vice versa), there is a byproduct that requires disposal— i.e., landfilling. Perhaps there should be some research here to economically process TDF/TDP/crumb residual?

California / CIWMB is highly fortunate to have financial resources to focus on the "tire sliver" portion of the waste stream. My observation upon reading the draft 5-year plan is that there is a need... if not a necessity... to redirect the scrap tire management program toward implementing innovative remedies... with well-researched concepts that are not bridled by paradigms or industry-players that have often fed from the CIWMB trough(s). The BAP program is not the answer, in my opinion, to creating better business in rubber-world. Your SB876 has an intent to "encourage tire manufacturers to... develop recycled-content rubber tires." This is routinely done in Europe by the same manufacturers that use minimal, if any, crumb rubber in the U.S. Perhaps RMA should put a little

more emphasis on recycled-content inclusion rather that focusing on use of rubber in other applications? The paper industry had the same issue until 1994 when President Clinton signed an Executive Order requiring post-consumer content in all Federal paper purchasers & several key states followed — result, $100 million capitalization in the paper industry to consume an incremental 10 million tons of recyclable fiber in the U.S. ——— California used to have a significant tire manufacturing industry. Now, the closest tire manufacturer is in Oklahoma and Asian tires by the millions come through California's ports. Perhaps we Californians should research what it would take to entice a tire plant to relocate here to consume crumb in it's process? Similarly, our playgrounds and roadways should be enhanced ... and our energy situation can not be deleted from consideration. Please endorse a "R-C-R" program (Rocks-Coal-Rubber) and allow the marketplace economics be the ultimate judge.

One final item that I do not understand (or am not reading correctly). Does the report valuate headcount differently between the various Staff/Administrative positions?

Plan Sector	# Positions	$ Budget	$/Position/Yr
Enforcement	16.75	$1.76 MM	$105K
Cleanup	3.75	0.63	$168K
Research	2.75	0.34	$123K
Mkt. Dev.	9.75	1.01	$104K
Manifest	6.50 // 39.50	0.66 // $4.40	$110K // $111K ave

From the above, it is very clear that "data gathering & monitoring"

(Enforcement/Manifesting) are the components with highest priority in the draft 5-year plan (almost 60% of headcount and 55% of staff/Administrative budget). Cleanup represents 9%/14% ... Research is at 7%/8% ... and Market Development is 25%/23%. In my humble opinion, I would recommend reallocation to emphasize leadership in innovative growth

1. Clean up remaining tire piles ASAP ... they are now down to a small nuisance — get rid of them & get on with promoting/developing uses for current generation scrap tires.

2. Develop an acceptable Enforcement/Manifesting system that delivers acceptable data to maintain an acceptable data base. In the grand scheme, the data base does not have to be "acceptable to seven decimal places". Tires are fluid in movement, travel through many hands, are processed differently, etc. Granted, you need to measure to be able to manage — but to what degree is the question?

3. Emphasize Market Development and Research. California should be exemplary in innovation. Silicon Valley is a result of Research, Development and Private/Public partnership in innovation. Where can we establish "Rubber Valley" and allow innovation to spawn beneficial commerce for the state? It's only done through leadership & not retardation by limited-or-limiting avenues of solution to pursue.

Rocks - Coal - Rubber is a pursuable program to resolve the scrap tire issue in an economically beneficial manner.